THE MEDICAL NEWS.

A WEEKLY JOURNAL OF MEDICAL SCIENCE.

VOL. XLIX. SATURDAY, OCTOBER 30, 1886. No. 18.

ORIGINAL ARTICLES.

CHRONIC PURULENT OTORRHŒA; ITS NATURE AND TREATMENT.[1]

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A CHRONIC purulent or mucopurulent discharge from the ear is usually the result of inflammation of the mucous membrane of the middle ear, and, as such, implies the existence of a perforation in the membrana tympani through which the purulent matter escapes into the external auditory canal, and from the meatus externus. The perforation in the membrana tympani is usually in the lower portion, posterior to or beneath the malleus, in that part of the membrane below a line drawn nearly horizontally through the short process of the hammer—*i. e.*, in the so-called membrana vibrans. In some rare, but very important, cases, the perforation is in the flaccid membrane, or the membrane of Shrapnell, which lies above the short process of the malleus. The latter may be the only perforation, or it may exist with one or more perforations in the lower portion, the so-called membrana vibrans, below the line of the short process of the hammer. Although there is no mucous membrane in the external auditory canal, a chronic purulent discharge, in some very rare instances, comes from the cutaneous walls of the canal, the membrana tympani remaining imperforate. These cases are so rare, however, as not to enter into the observation of any one who does not see a great deal of aural disease.

The rule is, that a chronic purulent discharge coming from the external auditory meatus emanates from the mucous membrane of the tympanic cavity, and indicates, therefore, a perforation in the membrana. A discharge from the ear deserves the name of chronic after a duration of two or three weeks. This form of aural disease is both common and important, is met by all practitioners of medicine, and demands, therefore, their careful attention, both on account of the annoyance its presence gives the patient, and the danger to hearing and life which lurks in its persistence in the middle ear.

Chronic purulent otorrhœa generally begins in childhood. Hence cases of this disease in adults are usually very chronic. The original course of otorrhœa is chiefly nasopharyngeal, and Eustachian tubal catarrh, induced by coryza, teething, and the acute exanthemata. Teething, by inducing a reflex irritation in the middle ear, leads practically to catarrhal inflammation of that cavity, perforation of the drum-membrane, and the establishment of a chronic running. Purulent inflammation of the middle ear is almost invariably preceded by pain, and often constitutes the cause of earache in children.

Among the causes producing purulent otorrhœa in adults, must be named swimming and diving in cold water, plunging the head under cold water, washing the head and allowing it to dry in a draught of air, and also the use of cold water in the nasal douche, and the inhalation of the various patent powders, snuffs, and fluid preparations advertised for the cure of nasal catarrh.

Tuberculosis of the lungs is also a cause of subacute and chronic purulent otorrhœa. This form is characterized by little or no pain, by its tendency to affect the posterior and upper parts of the drum-membrane and cavity, and by its resentfulness of all forms of treatment but the mildest. It is supposed to be due to reflex inhibition of vasomotor power in the arterioles of the ear, supplied by the carotids. The irritation which thus acts reflexly is in the diseased lung. The irritation, passing by the pneumogastric to the sympathetic system in the neck, inhibits influence over the carotids. Passive dilatation ensues in the vascular tract, and those parts of the membrana tympani and middle ear supplied by it undergo passive congestion and inflammation of a low form, without much or any pain, the purulent matter ruptures the membrana, and an otorrhœa, chronic from the outset, is established.

The tendency to chronicity in all aural discharges is favored by the difficulty of keeping the ear clean, and by the improper treatment so often instituted. The retention of matter in the fundus of the auditory canal favors decomposition of the pus, and further disease in the ear. The exposure, too, of the mucous lining of the drum-cavity to the atmosphere, by means of the perforation in the membrana, irritates the mucous membrane, and promotes further inflammation. It is to this fact that acute attacks of earache are due, in cases of chronic otorrhœa.

If chronic purulent discharge from the ear is associated with, and kept up by, chronic catarrh in the nasopharynx and the nares, the rhinitis must receive due attention, or the discharge will not, without great difficulty, be checked. Permanent cure of chronic otorrhœa can hardly be expected, if the nasopharynx remain profoundly diseased.

The natural tendency of chronic purulent disease in the drum-cavity is to impair the hearing. The loss of this function, and the disagreeable odor which attends otorrhœa, are the chief early inducements for patients to seek surgical aid. It is at this period of the disease that the surgeon can do the most good. The impairment of the hearing may be due to thickening of either the mucous membrane covering the ossicles and their joints, or of that over the fenestræ of the vestibule and the cochlea. This thickening of the mucous membrane on these parts

[1] Read before the Philadelphia County Medical Society, October 13, 1886.

brings about an ankylosis in the great mechanical means of audition, viz., the chain of the ossicula auditus, and in the membrane of the round window. By means of the latter, a compensatory yielding to the movements of the ossicles is effected in the normal state. Finally, the purulent disease may loosen the joints of the ossicles, or even destroy portions of them, and thus render it impossible to restore the integrity of the auditory chain. In some rare instances, either the foot-plate of the stapes in the oval window, or the membrane of the round window, is eroded, and hearing is hopelessly destroyed in consequence of the invasion of the internal ear and the auditory nerve.

The perforation in the membrana tympani, by relaxing the membrane, and altering the normal position of the ossicles, also aids in producing defective hearing. After the production of so much destruction in the membrana, disorder in the ossicles, impairment of hearing, and the establishment of a chronic purulent otorrhœa, the disease may continue uneventfully on this plane for years.

The patient may or may not undergo any form of treatment, or at most will cleanse the affected ear, in order to abate the odor which comes from it. If the hearing in one ear is good, the bad hearing in the running ear is endured, and the discharge is not thought of, if it is not copious or offensive. These are the neglected cases, and they tend to the development of granulations and polypi *upon the mucous membrane of the cavity of the drum.* As these form in the diseased ear, the discharge increases in quantity, and the hearing grows duller. These latter facts, as well as the greater anxiety about personal defects in early adult life, finally lead the patient to seek aid. Inspection now reveals a polypus, or perhaps two, with distinct pedicles. Or, if these have not yet formed, granulations are seen, which more or less obscure a view of the drum-membrane. Such granulations, if let alone, seem to coalesce and form the solitary polypus, or perhaps two polypi. Aural polypi vary in size, from a buckshot to a large marrowfat pea; or, if old, and sufficiently compressed by the auditory canal, they assume the shape of the latter, and finally extend from the meatus, after attaining a length of one and one-half to two inches.

Instead of the formation of polypi, the purulent disease may be more destructive, and produce death of the mucous-periosteal membrane in the drum-cavity, and of the subjacent bone. This death of osseous tissue in the aural tract may take place in the tegmen tympani, just beneath the brain, or it may ensue in the so-called antrum of the mastoid cells.

When the tendency of this disease has brought about necrosis in the regions named, the affection has assumed a most serious aspect, because a fatal issue may now be induced at any time by either an embolic process in the brain, the lungs, or the liver. Prior to this course, a fatal meningitis may be set up by an extension of the disease through the roof of the drum-cavity, or through the fenestræ, and thus into the labyrinth and brain, or the necrotic disease having passed into the mastoid cells, the lateral or sigmoid sinus may be affected and purulent phlebitis at this point aroused. A clot may then be formed in the sinus, pieces of which enter the circulation, and thus an embolic process established at some vital point.

Time does not permit us now to consider the various phenomena which would enable us to distinguish these manifold results of chronic otorrhœa. It is enough for us to bear in mind that chronic purulent disease of the mucous membrane in the drum-cavity is always competent slowly, or, in some instances, rapidly, to bring about profound disease in the bony box of the ear, situated very near the brain, and that this chronic disease may be prevented, and its fatal results averted, by proper and timely treatment.

In many instances in chronic otorrhœa, before the worst results occur, warnings of the unfavorable advance of the disease are given, in the form of facial paralysis, violent attacks of ear-pain, with fever and delirium, and attacks of inflammation within the mastoid cells. In some cases sequestræ are thrown off from the drum-cavity, from the inner or osseous part of the auditory canal, and from the mastoid cortex.

Facial paralysis indicates an invasion at the upper and back part of the drum-cavity, and that meningitis, from extension of the disease through the tegmen, may ensue. Inflammation of the mastoid cells is more likely to be followed by phlebitis of the lateral sinus, and its consequences.

Cases of chronic otorrhœa with mastoid inflammation, and phlebitis of the lateral sinus, sometimes terminate fatally by embolism in the lung or liver, without any cerebral disease. Not to neglect chronic otorrhœa is the most important lesson the surgeon can learn, for a cure of the very chronic cases, especially when any of the portentous phenomena I have named make their appearance, is nearly impossible. Patients should be encouraged to have aural discharges stopped as soon as possible, whether acute or chronic. It is an injury to them to foster in their minds the idea that discharges will stop of themselves, or, if not, that they had better continue to run. Abnormal discharges from no other part of the body are allowed to run on disregarded, and, surely, discharges from the ear should not be, for they are as amenable to proper treatment as those elsewhere, and, if neglected, may become serious. From the deep and peculiar situation of the drum-cavity, purulent discharges from this part of the head are likely to be retained, and to undergo decomposition. This favors continuation and extension of the disease, and the mucoperiosteal nature of the tissue in which the affection has its seat renders death of the subjacent bone imminent with consequent involvement of the cranial cavity. The patient, therefore, should demand of his physician an intelligent consideration of such a malady.

Treatment.—The first consideration in the treatment of chronic purulent otorrhœa is cleanliness and cleansing. Cleanliness is demanded in order to prevent decomposition of the discharge in the ear, and septic influences from such a nidus. Cleansing the ear is necessary to enable the surgeon to make a diagnosis of the condition of the fundus and the membrana, and in order to prepare the ear for treatment.

Cleansing the ear is best accomplished by the surgeon, and should very rarely, if ever, be entrusted to the patient. It is best effected by syringing with tepid water, either with or without a disinfectant, if the discharge is copious and tenacious. If, however, the discharge is neither copious nor thick, the ear can be cleansed by a small dossil of absorbent cotton on the cotton-holder. Failure in this procedure is often attributable to the use of too thick a pledget of cotton. This should not be more than five centimetres in diameter. If it is larger it gets wedged in the meatus or in the canal, the fundus is not reached, or only with difficulty and after pushing, which is painful to the patient, and may abrade the canal, or even the deeper parts of the fundus and the membrana.

The syringe may be employed without illuminating the ear by the forehead mirror, but the proper and successful employment of cotton on the cotton-holder can be done only under the best illumination of the auditory canal, by the forehead mirror.

In infants and very young children, with very narrow meatuses, cleansing is most conveniently done by syringing with warm water, the return current from the ear being caught in a towel held beneath the auricle. After syringing, the water must be carefully mopped out of the fundus of the canal by absorbent cotton, in order to gain a view of the diseased parts, otherwise the refraction of the water will give a very distorted view of the objects seen through it.

Cleansing the middle ear is furthered by using some form of inflation of the tympana.

After the first cleansing of the external auditory canal and its fundus, the surgeon should find out in what part of the membrana tympani the perforation is. This may be found either above the so-called folds of the membrane, in the membrana flaccida (Shrapnell's membrane), or below the folds, in the membrana vibrans. The first-named part is a very small portion of the entire part of the membrana lying above the short process of the hammer. The latter, that below the folds, constitutes what is generally known as "the drum." In fact, this part has received nearly all the attention from surgeons, as it is by far the most common seat of perforations. Sometimes a perforation exists in both these portions of the membrana tympani at the same time; but this is not common. It is highly important to determine in which of these parts of the drum-membrane the perforation lies, since the treatment must be modified by the position of the perforation.

Let us first consider those cases in which the perforation is large and in the lower part of the membrana, the membrana vibrans. These, as already stated, are the most frequent.

Earache from acute inflammation in the tympanic cavity, in such chronic cases of purulent otorrhœa, must be combated by gentle warm-water syringing or irrigation, and in protecting the inflamed mucous membrane with insufflation of powdered boric acid. These insufflations and all others can be done either with the blow-tube on the principle of the blow-pipe, or by the hand powder-blower.

In those cases of acute inflammation in chronic otorrhœa with large perforations in the membrana, the pain can often be allayed by the use of instillations of cocaine, because the perforation in the membrana permits the entrance of the solution into the drum-cavity, and its ready contact with the mucous membrane.

Cocaine solutions instilled into an ear with imperforate membrana tympani are impotent to quell pain in the ear. They also seem valueless even when the membrana contains a small perforation, because they still seem to fail to reach the inflamed mucous surface.

If coryza is present, as it is apt to be, in these acute attacks in chronic otorrhœas, it, of course, must not be disregarded. The prognosis in these cases is favorable as to restoration to a relatively normal or healthy state, if the subject is in ordinary health.

It is in these cases of purulent otorrhœa with large perforations in the membrana tympani, that preference should be given to the so-called dry treatment. In this form of treatment very little water is used for cleansing, and only when the discharge is thick and copious, and hence not easily removed by absorbent cotton. The reason for this preference of dry treatment is that the use of water favors the continuance of the discharge in many cases, and promotes a tendency to the formation of granulations and polypi. If syringing the ear is to be done, it must be carried out by the surgeon, and not entrusted to the patient. After the ear is cleansed by either of these methods, some form of boric acid, finely powdered, should be employed by insufflation. This enters the tympanic cavity, and hence comes in direct contact with the inflamed mucous membrane. It remains there more readily than fluid preparations and hence acts longer. The beneficial effects are due to the antiseptic properties of the boric acid, and to the protection the layer of powder gives the mucous membrane. Boric acid may be combined with hydrastin, ten grains to the ounce; calendula one part to two of boric acid; resorcin one drachm to the ounce; chinoline thirty grains to the ounce; alum ten grains to the ounce; salicylic acid or iodoform. This treatment can be carried out only by the surgeon, and during the intervals of treatment the patient is to do nothing himself in the way of treatment. It should be performed every day until the discharge begins to lessen; then at increasing intervals of time.

If this dry treatment does not give entire satisfaction, as it may not or will not, if granulations or ulcerations exist beyond the reach of the powder thus blown in, resort may be had to instillations of astringent and antiseptic solutions, as nitrate of silver—not less than forty grains to the fluid-ounce of water; or carbolic acid solutions from three per cent. to five per cent. in strength. These are to be put in the ear after it is cleansed, and followed by a dressing of insufflated boric acid, either in simple or in compound powder.

In cases of chronic purulent discharge from the attic of the tympanic cavity with perforation only in the membrana flaccida, the dry treatment cannot be relied upon, because of the smallness of such perfora-

tions, and the consequent inability of the surgeon to blow the powder into the diseased cavity. In these cases the treatment consists in the application of solutions to the attic through the perforation by means of the tympanic syringe. The long slender nozzle, six centimetres long by one millimetre in diameter, must be conveyed under illumination by the forehead mirror, down the auditory canal to the seat of disease. I have found the best results to follow the use of injections of a three per cent. solution of carbolic acid by this means into the attic cavity of the tympanum after thorough cleansing of the attic by injections of hydrogen dioxide, which thoroughly removes all pus. They do not tolerate nitrate of silver. It is well to follow these applications by insufflations of boric acid into the fundus of the auditory canal. For though they cannot reach the attic unless the perforation be large, they have an antiseptic effect about the perforation and the rest of the outer surface of the membrana tympani and the fundus of the canal.

Cases of chronic purulent disease in the attic are difficult to treat, on account of the bad drainage from those parts above the ossicles, and because of the small perforation usually found in the membrana flaccida. They are also dangerous to the life of the patient, because the disease lies near the tegmen tympani, directly beneath the brain. Natural deficencies in the bone at this point exist so frequently that the meninges and the mucous membrane of the roof of the drum-cavity are often in apposition. The hearing, too, is nearly always impaired when the attic is diseased, because the joints of the ossicles, especially the malleo-incudal joint, are greatly involved, and their vibrations impeded.

In order to facilitate better drainage of purulent secretions from the attic in chronic disease, and more efficient medication, especially by the insufflation of powders, Dr. Sexton has suggested, and frequently performed, when the membrana is largely destroyed, its removal and then that of the malleus and incus, or their remnants. The fundus is then treated with a powder of salicylic acid and boric acid, until a dermoid cicatrization ensues. This operation is applicable to chronic attic disease, *without perforation of the membrana flaccida*, but with large destruction of the membrana vibrans, in which the diseased malleus and incus interfere with drainage of the attic, downward into the atrium.

In every case of chronic purulent otorrhœa, if the nasopharynx and pharynx are markedly affected at the same time as the ear, they must also receive treatment. Some forms of chronic otorrhœa are certainly aggravated in adults, by decayed teeth and diseased gums. For the discharge in such cases, which may have been inveterate, or often recurrent, ceases upon the removal of the diseased teeth, usually some of the molars, and the healing of the gums.

In any case of chronic purulent otorrhœa, so long as we can detect no lesion beyond impaired vibration in the ossicles, with defective hearing, as a consequence of the chronic disease in the mucous membrane, the cure of the affection may be considered as probable, excepting in tubercular cases far advanced in pulmonary disease. By curing the purulent disease of the mucous membrane, the growth of granulations and polypi, and the occurrence of necrosis and caries of the adjacent bone, are prevented.

If, however, the ear has not been treated, or improperly treated, granulations and polypi may be found, with impairment of the hearing. The granulations are best removed by touching them, and only them, with chromic acid, carefully conveyed to their surfaces on a small cotton tuft, not more than two millimetres in diameter, on the cotton-holder, under perfect illumination of the canal and fundus by the forehead-mirror.

If polypi, with distinct pedicles, have grown from the mucous surface of the middle ear, and extend into or from the perforation in the membrane, they must be extracted with the polypus snare, and their pedicles touched every day or two, until they disappear. These are entirely curable, and the discharge from the ear usually ceases after the removal of the polypus and the destruction of its roots, and the hearing improves. The removal of the polypus, without subsequent treatment and destruction of its pedicle, is useless.

Instead of this conservative, hypertrophic action, on the part of the mucous membrane, it may slough, leaving the subjacent bone bare. The latter then dies, either superficially or in its profounder parts, and some of the evils I have sketched are experienced by the patient. If such cases are seen before they have advanced beyond the destruction of the mucous membrane, and properly treated, the mucous membrane may be repaired, and necrosis of bone beneath it averted. In some cases of profound inflammation and ulceration of the mucous membrane of the drum-cavity, denuded bone can be felt with a probe, and crumbs of bone are thrown off with the aural discharge. But with the improvement in the condition of the ear, these particles of dead bone cease to appear, and denuded bone can no longer be felt. In such cases the ear should be syringed once daily, by the surgeon, with tepid water, in which salt or potassium permanganate may be placed. Or the ear may be syringed with weak solutions of corrosive sublimate, 1 : 1000, carbolic acid five per cent., or with undiluted peroxide of hydrogen (Lehn & Fink's, or Schiefflin's). This drug has the great advantage in breaking up and removing all pus, and of informing the surgeon when this is accomplished, by the cessation of foaming which ensues as soon as there is no more pus, with which it makes a frothy reaction. Thereafter the ear is to be dressed with the powder of boric acid already named. Cleanliness and antiseptics, with attention to the general condition, form the guiding motives in the treatment.

If sequestra form, they should be removed if possible. In this way portions of the labyrinth, or the cells and cortex of the mastoid are at times taken from the ear, and the parts of the cranium near it. So long as they remain, as it were, in the aural tract, they are obstacles to cleanliness and points of infection threatening the entire system.

In many cases, indeed I am inclined to say in most cases, of necrosis of the cranial wall from chronic aural purulency, operative interference is well-nigh

useless. Unless it be the mastoid cortex, all other parts of the auro-cranial surface are extremely difficult to operate upon, and surgical interference becomes a dangerous undertaking. Again, when the surgeon is consulted in cases of intracranial disease, a systemic septicæmia, arising from chronic purulent disease and necrosis in or about the ear is established, and the patient is beyond aid. To trephine for cerebral abscess, which has resulted from chronic aural disease, is to operate on a moribund patient, and to hasten surely the fatal issue. The time to aid such a sufferer was when the chronic purulent otorrhœa could have been checked, and before it had induced necrosis of bone or embolism. In my opinion, there never is a moment after the cerebral abscess is formed, that an operation for its relief is justifiable, excepting perhaps in those instances in which a sinus can be found leading to it from the mastoid or squama. In regard to mastoid trephining, for so-called mastoiditis and periphlebitis of the lateral sinus, my opinion is much the same.

The mastoid cortex can be easily perforated and the mastoid cavity opened, the operation in itself being comparatively a simple and safe one. But such an operation is rarely, if ever, needed, because an acute inflammation originating in, or limited to, the mastoid cells, without possibility of other escape, rarely if ever occurs; and for such a disease alone would trepanation of the mastoid cortex be demanded.

I admit that a chronic purulency in the tympanic cavity may gradually and painlessly affect the mastoid antrum, its cells, and its outer cortical as well as its inner wall, which is the outer wall of the lateral sinus. This diseased state in the furrow of the lateral sinus is of the most serious import, but an operation on the mastoid cortex cannot arrest its progress or remedy its effects. Too often when pain in the region of the mastoid is felt, and other well-known symptoms of so-called mastoiditis arise, the pain is really due to inflammation in the lateral sinus, or deeper parts from such chronic disease in the bone, and not to matter pent up in the mastoid cells, which a perforation in the mastoid can relieve. I am forced to such conclusions, because fluid matter from the drum-cavity and mastoid antrum can escape, in most cases, from the external ear. Also, because in many cases of pain in and about the mastoid, with symptoms which are supposed to justify trephining its outer cortex, the cavity has not been found filled with fluid matter seeking an escape, but with some inspissated pus at most; while periphlebitis in the lateral sinus has been discovered, having its origin from the neglected tympanic disease, which trephining is powerless to cure.

Even if the mastoid cortex and cavity are found diseased, an operation upon them will do no good if the lateral sinus is diseased, and perhaps the seat of a clot.

When mastoid operations are supposed to have been of value and to have done good, as has sometimes been claimed in acute cases of otitis media, there is ample evidence that they were not really needed.

In many cases of tumefaction behind the ear, in painful acute inflammation in chronic cases, Wilde's incision does give great relief. And in some such cases where this incision has been followed by perforation of the bone, and relief and apparent cure have followed, it has been because there was no disease in the inner mastoid wall and the lateral sinus. In such cases the local depletion gave the relief, and the mastoid perforation was purely gratuitous. The result would have been just as fortunate without the embellishment of the operation of trephining the mastoid. Hence in acute cases of otitis media great care should be taken not to resort precipitately to mastoid trepanation. In chronic cases it is of value in very few instances, and the indications for its employment are not well defined. In many cases the mastoid becomes œdematous, brawny, shining, sensitive to both deep and superficial pressure, and painful to the patient. These are often relieved by poulticing and leeching, without even Wilde's incision. Sometimes if let alone, they undergo speedy resolution.

In any such instance of supposed mastoiditis, consequent upon chronic otorrhœa, the simplest means of treatment at our command should be used. If the lateral sinus has not been invaded, there is no need of haste. If it has been attacked, mastoid trephining will certainly not check it.

It must not be forgotten that many instances of pain and swelling about the mastoid are due to congestion and swelling in its mucous lining, and in that of the middle ear and mastoid antrum. The circulation both within and without the mastoid is then impeded, and swelling, œdema, and tenderness of its outer surface are the result. Hence the relief obtained sometimes by spontaneous resolution, or by artificial depletion over the cortex of the mastoid. As the swelling in the mucous membrane of the middle ear and antrum goes down, relief is given to any matter which may have been dammed up in the mastoid cells, and which now escapes and runs into the external ear, and the mastoid pain and swelling disappear.

ON TETANY AND TETANILLA.[1]

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Amongst the convulsive diseases of the nervous system which we are in the habit of encountering in the practice of our profession, there are some which have, on account of the extreme severity of their symptoms, engrossed the attention of physicians almost from time immemorial. The principal representative of this class is epilepsy, which was for a long time believed to be a special infliction sent by the wrath of the Almighty, being termed *morbus sacer* by the classical writers. Tetanus arising from injury and exposure to cold, was likewise already well known to Hippocrates and Aretæus, and has, as well as epilepsy and chorea, engaged the attention of innumerable observers, while even at the present day all these diseases offer to those

[1] Read before the New York County Medical Society, October 18, 1886.

who are willing to investigate them patiently, points of interest that are still involved in obscurity. The complaint to which I intend to refer to-night has, no doubt, always existed, like the more formidable diseases which I have just mentioned, but has only been recently recognized as a special entity, partly, no doubt, on account of its symptoms being habitually much less severe, and partly from having been confounded with other diseases, which although they resemble it in some particulars, are nevertheless totally distinct from the same.

Tetany is not frequent, but where it occurs it presents points of considerable physiological and pathological interest, and is occasionally so severe as to lead to a fatal result. It is also practically important for physicians to be familiar with its clinical features and its pathology and treatment.

There is another kindred complaint to which I have for many years past drawn attention at the hospital, and which I have termed tetanilla. I have, however, up to the present time never published my observations on the subject, and was, in 1881, forestalled in this point by the late Prof. Friedreich, of Heidelberg, to whom we owe such excellent work on muscular atrophy and hypertrophy, and who was also, as you know, the first to describe that peculiar and unusual form of locomotor ataxy which runs in families and habitually begins about the age of puberty, and which is now generally designated by the name of Friedreich's disease. This able pathologist, whose premature death from aneurism of the aorta we deplored not many months ago, gave to the complaint which I have just introduced to your notice as tetanilla, the somewhat barbarous name of paramyoclonus multiplex. Löwenfeld and Seeligmüller have more recently described cases of this affection, and I will make use of the opportunity which this meeting affords me to speak of my own experience with regard to it. Of course, I do not in the slightest degree wish to interfere with Friedreich's unquestionable right of christening a disease of which he was the first to record his observations; but I confess that the name tetanilla which I had, as it were, privately given to the affection, sounds to me much more euphonious than paramyoclonus multiplex, while the fact that both appear to be functional disorders of the nervous system, showing their chief symptoms in closely allied muscular disorder, would seem to favor the idea of giving them somewhat analogous names, showing at the same time in the word tetanilla, the less degree of severity which the latter form is apt to assume in practice. It will, however, be for the profession to decide which name shall eventually be adopted.

I think I shall do best if I commence my remarks on tetany, of which I have seen altogether ten cases —four in males and six in females—with a short historical retrospect of the work which has been contributed by various authors who have had opportunities of investigating this complaint. I do so more particularly because recent French writers have claimed it as a peculiarly French disease, and one which has, according to them, "une paternité toute française;" the fact being that the first description was given by a German physician, Steinheim, in 1830, while the first French publication, by Dance, appeared quite a twelvemonth later, viz., in the *Archives Générales de Médecine* for the year 1831. Of course, it is not to be supposed that Dance should have been acquainted with Steinheim's essay at the time he wrote; for the French have only commenced at a very much later period to read German publications; and when Dance wrote they were in the habit of looking upon everything German or English as only fit for barbarians, whose prescriptions might be good enough for horses—"médecine de cheval" being even now a not uncommon term with the French for any foreign system of treatment. At any rate this fact remains, that Steinheim was a year in advance of any other writer on the subject, and it seems, therefore, hardly fair that Delcroix should in his recent thesis on the subject, moved no doubt by the noblest patriotic sentiments, have substituted the year 1830 for 1831, as the date of publication of Dance's paper. I have myself verified the reference; and while I am free to admit that Dance's publication is an unusually able one, I have to state that in point of time it is unquestionably the second, not the first. Dance, who was then physician to the Hotel Dieu, at Paris, has given a detailed description of four cases of the affection, and pointed out with considerable minuteness its difference from simple cramps, muscular rheumatism, tetanus, hysteria, as well as certain affections of the spinal cord, nerves, and muscles. He laid stress on the paroxysmal character of the spasms, and the favorable issue of all cases in spite of occasionally alarming appearances; and believed the disease to be a kind of intermittent and non-pernicious tetanic fever. I may here at once say that, although Dance's paper is more interesting than Steinheim's, nevertheless the French writer's view of the pathology of the complaint—viz., that it is owing to malaria, has not been confirmed by further experience; while the German author's statements that the rheumatic diathesis is at the bottom of the disease, has, at least for a certain number of cases, turned out to be correct.

The name, tetany, which is universally used, originated with Corvisart, in 1851. Trousseau, who in his practice at the Hotel Dieu, in Paris, enjoyed unusual opportunities of studying the complaint, met with it at first only in nursing women, and called it rheumatic contracture of wet-nurses; but he soon perceived that it also arose from other causes than lactation, although he looked upon the latter as the most active and frequent causative influence. The complaint was subsequently studied by Moxon, who termed it remittent tetanus, by Wilks, Riegel, and more especially by Kussmaul (in 1871), whose fine clinical instinct enabled him to draw such a striking picture of the complaint, that he succeeded more than any previous writer in attracting general attention to it. Erb, Chvostek, and Weiss are amongst the later authors who have added their quota to the pathology of this disease.

Tetany consists of a succession of attacks of tonic spasm or rigidity of certain groups of muscles, mostly symmetrical, which follow one another at somewhat

irregular intervals, and are after a variable time followed by relaxation. The attacks are not accompanied with loss of consciousness, but there is throughout the course of the complaint undue mechanical and electrical excitability of the motor nerves and muscles.

The chief causes which appear to give rise to tetany are certain kinds of irritation acting on an otherwise predisposed or enfeebled nervous system. Thus, it occurs after and in consequence of persistent diarrhœa, more especially in the underfed and half-starved children of the poor. Kussmaul has described the case of a boy, aged six, who had been brought up by hand in wretched surroundings, and had lately lived almost exclusively on small beer; indeed during the first few days the little fellow was in the hospital, he refused all food excepting beer, and suffered from incessant diarrhœa. He eventually recovered from the diarrhœa as well as the tetany, but was three months afterward seized with a violent attack of vomiting and purging, after which the tetany reappeared. The same cause I ascertained in the case of a little girl, aged three, whom I saw at the hospital in 1881, and who had been reduced almost to a skeleton by incessant diarrhœa. The attacks came on in her hands and feet every few hours, and lasted about twenty to thirty minutes, during which time she kept yelling in the most fearful manner. Her mother had suffered from hysterical fits, and a sister had had chorea. Obstinate constipation and entozoa in the intestine have likewise acted as exciting causes.

A case is on record in which the ova of tænia medio-canellata and trichocephalus dispar caused tetany, which latter ceased after the parasites had been expelled from the bowels. The irritation of dentition has likewise been assumed to give rise to tetany, although the evidence supporting this point is not strong. Irritation in the sexual sphere of women, and occurring in connection with menstruation, pregnancy, the puerperal state, and lactation is, however, an undoubted factor in the production of the complaint. It also occurs after smallpox, cholera, typhoid fever, and other acute diseases; indeed, Aran has seen it occurring in a dozen convalescents from typhoid fever who were in the hospital at the same time. Bauer has also seen it simultaneously in three women of the same family who had eaten unwholesome bread. This had been procured from a distance on account of its cheapness, and was so mouldy and nasty that the men of the family refused to touch it. None of them had tetany, and the three women recovered after discontinuing to eat of this particular bread. Bauer thinks that it may have contained ergot of rye, but could not procure a sample for analysis.

Another active agent in the production of the complaint, and which was chiefly dwelt upon by Steinheim and Trousseau, is the influence of wet and cold. The latter observer describes the case of a man who was found in the streets of Paris one morning in winter, having passed the night there in a state of intoxication, and being so stiff that he was believed to be in an epileptic fit, yet he had been quite conscious all the time. While under observation in the hospital, he was found to be subject to attacks which lasted from a few minutes to half an hour, and had such good use of his limbs in the intervals as to enable him to attend upon the other patients in the wards. On account of the undoubted influence of cold in its production, tetany has also been called intermittent rheumatic contracture. Sleeping habitually in damp rooms, or working in damp shops, appears to favor an outbreak; and exposure, no doubt, often acts concurrently with other influences. Thus, one of the nursing women in whom Trousseau saw tetany, was found to have got out of bed in the night and gone outside into the yard of the hospital in order to fetch water from a pump in midwinter. She died of asphyxia produced by tetany of the respiratory muscles shortly afterward. In one of the cases which have fallen under my own observation, tetany came on quite suddenly in a young man aged eighteen, who had, while skating in the Regent's Park, in London, broke through the ice and had been nearly five minutes in the water before he was rescued. An emotional influence, however, was probably likewise active in this case in addition to the chill, as the patient being unable to swim, underwent an agony of fear of drowning all the time he was in the water. It is not uncommon that there should be several influences at work in determining an outbreak of a nervous affection; I will only remind you of tabes spinalis, in cases of which we generally find a history of three causes, viz., syphilis, exposure to cold and wet, and over-exertion, whether physical or mental.

An emotional influence was likewise evidently at work in another case of tetany which was under my care in 1879, and which was that of a young lady, aged twenty-one, who had been engaged to be married, and in whom the disease appeared quite suddenly the day after she had had a quarrel with her lover, in consequence of which her engagement had been broken off.

Simon and Regnard have described what they call an epidemic of tetany, which occurred at Gentilly, in France, where it went through a young ladies' school. At first the cases were very few; one girl was affected in July, and another in October; in November, however, quite an epidemic broke out, there being eight new cases on one day, and eleven on the next. The governess at first tried to arrest the progress of the disease amongst the girls, but eventually got it herself. The school was then broken up, and all the girls recovered rapidly. Similar epidemics have been described as having occurred in some prisons and asylums in Belgium. It is, however, quite clear from the description given of the epidemic among the French schoolgirls that there was no real tetany present, but that it amounted to an endemic manifestation of hysteria which, in its symptoms, had a considerable resemblance to tetany. We know that hysteria may mimic most diseases, and need not, therefore, be surprised that it will occasionally mimic tetany. With regard to the cases observed in the public institutions in Belgium, it appears probable that they were in reality such an epidemic of spinal meningitis, as in some of them an inspection was obtained showing the patho-

logical lesions of meningitis; and I shall presently in my remarks about the diagnosis of tetany, refer to the possibility of its being occasionally confounded with that disease. It is, however, a fact that cases of tetany do sometimes occur together; but the explanation of this would seem to be the influence of exposure to unusually severe cold prevalent at the time. Thus, Weiss had twelve cases under his care in the severe winter of 1881, at Vienna, and Chvostek saw seven in the winter of 1880, in Austrian soldiers who, during target practice, suffered considerably from exposure to the intense cold which then prevailed.

In May last, Ord, of London, exhibited at the Medical Society of that city, the case of a woman who showed the usual symptoms of myxœdema, and in addition to them a peculiar symmetrical contracture of the flexor muscles of the hands and legs, strongly resembling tetany. In connection with this case it is interesting to remember that Weiss has seen four cases in which the excision of the enlarged thyroid body, by Prof. Billroth, of Vienna, appeared to give rise to the affection. In one of these cases it appeared on the sixth day after the operation; in a second, on the evening of the same day, and in two other instances immediately afterward. One of these patients eventually died of it. In another case the tetany lasted six days after the operation, then disappeared, but relapsed when an abscess had formed in the neck; it ceased finally after this had been opened and healed. Weiss does not assume any particular relation to the bronchocele, but thinks that it was only the irritation caused by the surgical operation *per se* which caused the tetany; yet it seems a curious coincidence that four cases of tetany should have appeared in connection with thyroidectomy, while it is not known to have occurred after any other surgical operation; and in connection with this, Ord's case which I have just mentioned, is of interest, as raising the question, whether there may not be some more intimate connection between atrophy or absence of the thyroid gland and tetany, than has hitherto been assumed. I would recommend this point to your attention, should similar cases present themselves in your practice.

Tetany has probably no connection at all with certain kinds of occupation, as has been assumed by some writers. Indeed, it has by some been termed cramp of tailors, cobblers, and seamstresses, or professional spasm generally; but the fact that it not uncommonly affects infants, as well as women who have no particular kind of manual labor to perform, and finally in men in all kinds of occupations, speaks strongly against this assumption. The age at which it is most frequent, is the period between one and five years, and again that between fifteen and thirty years. As to the influence of sex, females seem to be rather more liable to it than males.

On reviewing all the different determining influences which I have just mentioned, it is impossible not to be drawn to the conclusion that they can, one and all, only be looked upon as exciting causes; and that constitutional neurotic disposition must be present in patients in order that such causes as cold, diarrhœa, etc., may be effective in leading to the outbreak of tetany. As, however, this point has not as yet been very clearly made out, I have taken some trouble in gaining information upon it in those cases which have happened to come under my care. The result has been that in not a single case was there any direct heredity, for to all my patients and their friends and relations the disease was entirely new, and something they had never known or heard of. In five out of ten cases I have seen, however, such diseases as hysteria, migraine, epilepsy, and chorea had occurred in the parent or other members of the same family. This would already give a proportion of fifty per cent.; but I have to add to this a case of atavism, as the maternal grandfather of one of the patients had died insane; and another case where the parents of the patient were first cousins, and where therefore a neurotic predisposition might be assumed to exist. It is therefore seen that only three cases out of ten were, or appeared to be, entirely free from a neurotic taint, so that my contention of a constitutional tendency being at the base of the complaint, would appear to be well substantiated; more especially when we remember that either through ignorance or carelessness of the persons concerned, the family history given us in such cases is frequently far from complete.

The evolution of the symptoms of tetany may be somewhat rapid or more gradual. In some cases, and, according to my experience, more especially in those where a cause has acted very suddenly, the disease may appear at once fully developed; while in those where the power of resistance of the nervous system appears to have been more gradually undermined by various deteriorating influences, there is a progression in the symptoms which goes from piano through the different degrees of crescendo up to forte, and eventually to fortissimo. Amongst the premonitory symptoms, where such are present, we find more particularly a general feeling of malaise, as of some impending illness, headache, dizziness, specks floating before the eyes, and a feeling of stiffness and awkwardness, or shooting pains in the limbs. Slight temporary rigidity of certain muscles may be combined with this, or there may be a few twitches which subside again presently. These symptoms generally become aggravated, and eventually tetany sets in. Both hands are then seen to have assumed a peculiar position, which is not always the same, but varies according to the several groups of muscles which may happen to be affected. In most instances, it is the muscles supplied by the ulnar nerve which suffer; in some, those under the control of the median nerve, while only very occasionally those which receive their motor impulses through the musculospiral nerve are affected. In accordance with this, it is found that the common position of the hand in tetany is the conical one, resembling that which the accoucheur uses when introducing his hand into the vagina. In this the thumb is forcibly adducted, and the fingers are flexed in the metacarpo-phalangeal joint and pressed against the thumb, while the wrist is bent and turned toward the ulnar side of the arm. The spasm may stop there, or proceed higher up, involving the forearms, which may be bent and

crossed over the epigastrium, and the arms, which may be strongly adducted to the body. In some cases, again, the fingers are so strongly clenched that the nails enter the flesh and produce eschars; the thumb may almost disappear underneath the other fingers, or it is squeezed between the first and second finger so as to show the thumb-nail between their first phalanges. Where the interosseous and lumbrical muscles are rigid, the hand assumes the bird-claw position which was first described by Duchenne. Or there may be spasm in the extensor muscles, the fingers and wrist being stretched out, and unable to be bent, and the fingers being wide apart. A considerable variety of positions may thus be produced, and it is therefore important to remember that the position of the hand which was first mentioned, is not absolutely pathognomonic of the disease. At the same time there is in true cases of tetany, always some degree of rigidity in the muscles supplied by the ulnar nerve, and when this is entirely wanting, the case is most probably not one of tetany.

In the lower limbs the spasm is generally seen to begin in the toes, which are held in plantar flexion, closely pressed against each other, but extended in the metatarso-phalangeal joint. The big toe is adducted and beneath the others, the foot in the varo-equine position, with the heel drawn up, and the tendo Achillis strongly retracted; or, again, the toes may be stretched out, and each one be as wide apart from its neighbors as possible. The feet may be adducted, the knees extended, and the thighs stretched on the pelvis, while in other cases the legs are drawn up to the abdomen. Walking during the attack is thus rendered difficult or impossible; indeed, sometimes there is persistent contraction of the muscles of the calves, so that the patient is quite prevented from moving about, while in other cases the rigidity is so distributed that only the heel touches the ground, and the toes are raised up. The effect of this is the same, viz., to interfere altogether with walking.

In some cases only one side of the body, or only the upper limbs, or only the lower ones are affected, or they may suffer alternately; but mostly there is symmetrical affection in both sides of the body.

In the large majority of cases, only the muscles of the extremities are thus affected; but in some the rigidity also involves those of the head and the body. The head may be pulled down on the chest, and the spine curved; the muscles of the neck may be so rigid as to stand out like tight cords, and to compress the jugular veins; the lips and tongue may be quite rigid; the eyes may be spasmodically closed, and through contraction of one or the other of the ocular muscles, the various forms of strabismus may be produced. The face may be devoid of any mobility of features. The muscles of the lower jaw, and of the pharynx and larynx, likewise do not escape in some cases, and this leads to difficulty in masticating, swallowing, and breathing. In extreme instances there is spasm of the glottis, with great dyspnœa and cyanosis. The diaphragm and the other muscles of inspiration then appear to be fixed, and if this condition is not speedily relieved death from apnœa is the result. Even the bladder may suffer, as shown by retention of the urine, together with frequent desire to micturate. A very bad attack, in which dyspnœa may be so severe as to threaten the life of the patient, sometimes ends with profuse perspiration, and as soon as this is well established, all symptoms are relieved. In one of Dance's cases, perspiration was so abundant as to form a cloud of steam around the patient.

The contraction of the muscles is sometimes very painful, and more especially so in children, who often scream and yell throughout the attack. In other cases there is rather a stiff and bruised feeling than actual pain, together with great tenderness on pressure. The degree of contraction may vary from one minute to another, and this occasionally leads to spasmodic jerkings of the muscles. Where there is much pain, the patient is restless and agitated during the night, and desires constant change of position, while another may lie still in bed like a statue. During the attack the muscles may be entirely withdrawn from the influence of volition; in other cases the rigidity is more moderate, and allows of some degree of movement. Habitually the muscles feel as hard as iron. In a severe case there is so much resistance to passive movements that a great deal of force is required to counteract the rigidity; and the instant we let go, the contraction reasserts itself. Attempts to overcome the rigidity are very painful. Friction often diminishes the rigidity, while pressure may increase it. A sudden impression of cold and heat may also arrest the spasm; thus, if the patient be made to stand with his naked feet on the bare floor, or if his hands be immersed into vessels filled with hot or cold water, the rigidity may relax, but only to reappear again as soon as the influence of these agents is withdrawn. The duration of the attack is variable; it may last only five minutes or as many hours, and may be repeated over and over again; but where the condition appears to have continued for days together, it is probable that, as in certain cases of epileptic fits, the intervals have been short, and remained unnoticed by the attendants. If this should not be the case, then I would say that the case was not one of tetany.

Trousseau was the first to notice that, so long as the diseased condition persists, we may, at a time when the patient is quite free from rigidity, produce it almost immediately by compressing the affected limbs, more especially at points where we can act on large nerves or vessels, so as to interfere with circulation. This discovery was made accidentally. He had ordered a woman suffering from tetany to be bled, and noticed that when the bandage was drawn round the arm, the muscles below tightened. He afterward found that such an affect is produced more especially with the upper limbs, where pressure on the brachial plexus above the collar bone, or the median nerve in the arm, will lead to it. In the lower limbs pressure on the sciatic nerve or the femoral artery may do the same; but here the result is not so quick and certain as in the upper limbs. In one case Trousseau found a very suggestive illustration of the well-known law of reflexes formulated by Pflüger, viz., that the effect of the stimulation is greatest at or near the spot where it is applied, and

that an increase of stimulus is required for affecting more distant parts, which are then acted upon in a certain order. In that case ligature of the right thigh produced first contraction in the toes of the right foot, then in those of the left foot, afterward in both hands, and finally a violent attack of hysteria.

Kussmaul was led by his observations on this symptom to the result that it is pressure on the arteries rather than on the nerves, which causes these effects in the muscles. When he compressed the brachial artery of a patient during a free interval, he noticed that in twenty or thirty seconds the fingers began to twitch; in two or three minutes the flexion appeared to be increasing, and very soon afterward the hand and forearm were spasmodically bent. The proceeding was not painful; when the pressure was withdrawn, the spasm disappeared, and pressure on the nerves did not cause the same effect. My own observations have led me to the result that Trousseau's symptom is produced by pressure both on the nerves and on the bloodvessels, and that complete compression of the latter leads more quickly to the expected result than that of the former. This is more particularly seen in the lower extremities, where compression of the femoral artery in front of the os pubis brings about muscular twitches and rigidity much more rapidly than compression of the sciatic nerve in its notch.

My study of this point has also led me to a very singular observation, which is likely to prove of some importance in the differential diagnosis of tetany from hysterical contracture, as it tends to show that tetany and hysteria are two widely different conditions. I have seen cases of hysterical contracture closely resembling the habitual position of the hand in tetany, where the history of the case was obscure, and it was difficult to make out whether the muscular rigidity was paroxysmal, as it is in tetany, or continuous, as it is in hysteria. In these cases compression of the limbs by Esmarch's bandage enabled me to decide this question; for it appeared that while in tetany pressure increases the rigidity still further, on the contrary, in hysterical contracture the rigidity was relieved, and ceased after the bandage had been applied for some time; to return, however, again almost immediately after the pressure was withdrawn. This singular circumstance seems to show that the arterial anæmia and venous congestion which are produced in a limb by compression, may cause opposite effects according to the condition of the nervous system with which we may have to deal, leading in one case to contraction, and in another to relaxation of the muscles. This is a point which requires further elucidation, and the study of which I would recommend to you in similar cases, as it may eventually throw light on the more intimate nature of the vasomotor disturbance which is present in such conditions as hysteria and tetany, and of which we are as yet in almost complete ignorance.

Another important feature of tetany upon which I must dwell now, is an alteration in the electrical and mechanical excitability of the affected nerves and muscles, which occurs habitually in the cases now under consideration. Indeed, the faradic and galvanic excitability of the affected nerves which was first examined by Benedict, and afterward by Chvostek, Erb, and others, is generally found to be much increased. A feeble constant current causes with the cathode not only the ordinary closing contraction much more readily than in the average healthy subject, but also tetanus of the muscles, which continues for some time; and what is rare in man, although not uncommon in the frog, tetanus with opening at anode, and likewise with opening at cathode. Ready responses are also elicited with a very gentle faradic current; and this ensemble of phenomena constitutes the reaction of convulsibility.

These signs are chiefly marked when the disease is at its acme, become less striking as the patient improves, and disappear altogether when he is well. They occur, however, only in the nerves and muscles which are actually suffering from tetany, not in all the muscles of the body; and this easily explains the apparent discrepancy in the results obtained by the different observers. Erb saw no reaction of convulsibility in the portio dura, while Chvostek found it very marked there in a case in which the muscles of the face were suffering from tetany. The electric tests are not only of diagnostic, but also of prognostic importance, as they sometimes persist when the patient is apparently quite well in other respects. They then show us that the disease, although in abeyance, is not actually conquered, and that there is a liability to a fresh outbreak of the other symptoms. When, on the contrary, the responses have become normal, we may consider with certainty that the patient has recovered. They are, therefore, even a finer test than Trousseau's symptom, which may have disappeared at a time when the electrical reactions are still abnormal.

The mechanical excitability of the nerves and muscles is likewise habitually increased. A tap with the fingers or the percussion hammer on the nerves causes a sudden contraction in the muscles which they supply. This is more particularly noticeable in the sphere of the portio dura, where a slight blow in the region of the stylomastoid foramen, or the pes anserinus, or even the smaller branches of the nerve, effects sudden contractions of the facial muscles; and that not only during the attack, but also in the free intervals. A good way of producing the phenomena in question is that recommended by Schultze, viz., to pass the finger-nail rapidly down one side of the face, from the temple to the cheek and jaw, when all the facial muscles are seen to contract. The reflex excitability of the skin is not exalted, and has indeed nothing to do with the appearances observed; for when the skin is taken up in a fold, and then strongly squeezed or pinched, no effect takes place. This increased mechanical excitability occurs in the portio dura habitually, even where that nerve has otherwise apparently escaped the influence of tetany; and it is, therefore, a very important diagnostic help. We must, however, remember that it is not invariably present. Moreover, I have seen it in recent cases of paralysis of the portio dura, concurrently with the increased voltaic excitability of the muscles; and also in some patients suffering from neurasthenia and hysteria. This shows that it

will not do, in this as in other diseases, to rely on a single symptom for our diagnosis, but that we have to judge from the entire evidence which the aspect of the case offers to us.

Another symptom which exists during the free intervals is a decided loss of coarse muscular power. This can be shown by the dynamometer, which I have found to register habitually thirty or forty degrees less than we should expect from the general build of the patient, and this loss is made up after recovery. There is also subjectively a feeling of lassitude, and fatigue is easily induced by slight muscular exertion.

While, therefore, tetany shows us a great variety of symptoms in the motor sphere, these are much less conspicuous in that of sensibility. I have already stated that much pain is sometimes experienced during the attack, more especially by sensitive children, who are at the same time reduced in their general health, but some patients say that the pain is insignificant. There is, however, generally tenderness to pressure and percussion over the affected nerves and muscles, more especially during the attack, and the same is found in the spine, particularly at that decisive point, the seventh cervical vertebra. Feelings of cold or heat, pins and needles, and other forms of paræsthesia, are occasionally present, but as frequently absent. Sometimes, however, the sense of touch is blunt, so that the patient feels objects as if padded, and imagines that he is walking on a carpet when on a bare floor. The muscular sense is habitually not impaired.

There are few other symptoms to mention. Sometimes there are redness and œdematous swelling, more especially in the smaller joints of the fingers and toes, but also in the wrist and about the ankle, leading us to suspect an attack of acute rheumatism or rheumatic fever. The temperature is mostly normal, but rises to 100° or 101°, and even more in very severe or acute cases, and the pulse is thus accelerated, although habitually normal. There may also be headache, dizziness, flushing of the face, buzzing in the ears, impaired sight, with large and sluggish pupils, rapid breathing, loss of appetite, obstinate constipation and either unnatural dryness of the skin or excessive perspiration. In the majority of cases, however, the secretions do not appear to undergo any morbid change. It is true that Delpech has described albuminuric tetany, but these cases belong to a different class from those we are now considering.

The duration of the individual attack of rigidity varies from a few minutes to half an hour or longer, and the number of attacks during the day is even more variable. Sometimes there are only two or three, at other times there is an almost constant succession of them, reminding one of the status epilepticus, and going on during the night as well as day. The entire duration of the disease is rarely less than a month, and more commonly two or three months.

A few cases of tetany have ended fatally, but, in spite of this, morbid anatomy has not furnished us with precise data concerning the nature of any pathological change. One of Trousseau's patients died eventually of phthisis, and the upper portion of the cord appeared to be somewhat softened.

Kussmaul discovered myelitis in a young man who had been seized with paraplegia some weeks after having recovered from tetany; but the occurrence of paraplegia shows that the case was a complex one, and it therefore proves nothing. Langhans has microscopically examined the cord of a child which had died of tetany. He found the nerve-cells and fibres, as well as the interstitial connective tissue unchanged, but the arterioles showed thickening of the adventitia by deposition of cells, granules, and pigment; and this was in accordance with the symptoms observed during life, more marked in the upper than in the lower region of the cord, and more particularly about the anterior commissure. Such changes, however, which must have had a very gradual origin, cannot account for a complaint which often originates suddenly, and ceases almost as quickly. I fear that just as little can be learned from a case of Weiss's where death took place from œdema of the lungs, following lobular pneumonia at the left base, and in which Zemann found the brain and membranes slightly œdematous, but otherwise normal; the capillaries of the gray centre of the cord appeared distended, and in parts there were very small capillary hemorrhages, while the coats of the bloodvessels appeared normal. Such changes probably are effect rather than cause. In other instances hyperæmia of the dura mater, of the pia on the base of the brain, of the pons, bulb, and upper portion of the spinal cord, and of the peripheral nerves which had more especially suffered during life, have been found; and must likewise be looked upon as secondary rather than primary. Indeed, the great diversity and variety of these changes is in itself a proof that we have not as yet discovered the lesion of tetany; while other considerations lead us to think that, if there is a lesion, it is likely to be molecular rather than coarse, and that tetany belongs indeed to that large class of functional nervous affections which await the application of finer tests than we command at present, before we can have a clear insight into their nature.

Nevertheless some speculation seems to be allowable and even called for, more especially with regard to the localization of the trouble which is present in these cases. That it must be seated in some portion of the motor sphere is quite evident from the symptoms we have to deal with, in which the affection of motility overshadows everything else. We have a large choice from the central convolutions of Rolando at one end of the tract to the striped muscular fibres at the other. Which is primarily affected? De La Berge has pronounced himself for the muscular substance itself; Delpech Hasse and others for the peripheral nerves; Kussmaul, Erb, and Berger, for the spinal cord; Weiss, for the sympathetic nerve, which he believes to be in a state of irritation or disturbance which is constant, but periodically increased, and, while causing irritation of the gray matter of the cord and medulla oblongata, is itself caused by irritation in the bowel, womb, thyroid body, and other viscera. No one seems to have suspected the pons, crura cerebri, the central ganglia,

the white nternal capsule, and the central convolutions; and this appears quite intelligible, if we consider that the symptoms are habitually symmetrical, while the usual affections of the parts just named are, on the contrary, unilateral. A great medical philosopher, Hughlings Jackson, considers tetany to be due to perverted cerebellar influence. He looks upon the brain as the centre for the ordinary voluntary movements of the limbs, and the cerebellum as the centre for continuous or automatic movements in the body. Now supposing the cerebral influence to be temporarily removed, the cerebellar influence would be unimpeded, and lead to rigidity of those muscles which during health are chiefly innervated by the cerebrum. I confess that this theory seems to me very far-fetched. Most physiologists consider not the cerebellum, but the medulla oblongata and the pons Varolii to be the centres for automatic movements, while the cerebellum is credited chiefly with being the centre for the equilibration of the body. This latter function is, however, in no way disturbed in tetany, and this appears to me a sufficient reason for rejecting Jackson's hypothesis.

It appears to me that some light may be gained by comparing tetany with another disease, in which we have likewise hardly any symptoms excepting in the muscles, and of which we know by dissection the true morbid anatomy. This is infantile paralysis, as caused by poliomyelitis of the anterior gray matter of the cord. In such cases we have not infrequently symmetrical paralysis of certain groups of muscles, just as in tetany we have the opposite condition, viz., rigidity which is most frequently symmetrical, and which affects by preference certain groups of muscles, leaving others intact. In infantile paralysis, which is a structural disease, we have chiefly paralysis of extensors and abductors; while in tetany, which I believe to be a functional disease, we have rather an affection of the flexors and adductors. The nutritive centres of these groups of muscles we know to be large cells in the anterior cornua of the cord; and it is to an undue and exalted state of excitability of these cells that it seems to me most reasonable to refer the symptoms of tetany, just as we refer to destruction of these cells the opposite symptoms of paralysis in the group of muscles for which we know them to be the centres. The localization of the trouble in the gray cells of the anterior cornua would then have to be sought in the lumbar, dorsal, or cervical region of the cord, or in the motor nuclei of the medulla oblongata, in accordance with the localization of the symptoms in the muscles of the lower extremities, the body, the upper extremities, the neck, head, face, eyes, pharynx, and larynx. I confess that this seems to me the most natural explanation of the symptoms of tetany as they are seen clinically. Why irritation should in these cases affect more particularly the anterior gray cells of the cord and bulb, is, of course, quite as inexplicable as why it should affect certain gray centres in the brain in cases of epilepsy; but for the present all these final reasons altogether escape our grasp.

The *diagnosis* of tetany is not always easy, except in very pronounced or typical cases. Buzzard, a careful observer, has recorded a case as one of tetany, which was evidently, from his own description, one of hysterical contracture. The patient was a Jewish girl, aged ten, who had suffered for three weeks from persistent tonic contraction of the flexor muscles of the upper and lower extremity; there was some œdematous swelling, and over the knuckles a slight flush of redness, which made the case look like one of acute rheumatism. No intermission of symptoms was observed, nor did the muscles become relaxed during sleep. In a day or two, however, she began to improve, and had no return of the spasm. The chief feature of tetany therefore, viz., the intermittent or paroxysmal nature of the muscular spasm, was absent, and the case cannot, therefore, be said to have been one of tetany. We have, indeed, in the diagnosis of this disease, to rely chiefly upon the paroxysmal occurrence of the spasms, the peculiarity that they spread in a direction from the periphery to the centre, on Trousseau's symptom of potentiality of spasm, which is elicited by compression, and on the electrical and mechanical convulsibility of the nerves and the muscles.

It is not likely that tetany should ever be confounded with epilepsy, as there is never any loss of consciousness in the former, and the whole group of symptoms of the epileptic fit is totally different from that of tetany. In Jacksonian epilepsy the symptoms are likewise widely different, and I should not refer to it if I had not known of a case in which this mistake was made by a practitioner. I will, therefore, say that in Jacksonian epilepsy there are tonic or clonic spasms, which generally affect, not symmetrical parts, but one upper, or one lower extremity; that they begin most frequently in the fingers, and travel from there upward to the face, and sometimes end in general convulsions; that after the fit there is paresis in those parts which have been convulsed, and that this paresis eventually merges into paralysis; that, where general convulsions occur, consciousness is lost; and that after the parts have become paralyzed, they are still liable to be convulsed. In addition to these symptoms we generally find also headache, optic neuritis, and vomiting, pointing to the formation of a tumor in the brain, or some allied structural disease of the organ.

Spinal meningitis has also been occasionally mistaken for tetany; yet the difference between the two conditions is likewise very striking. In meningitis we have fever, severe pains in the back; no such periodical remissions of the muscular spasms as in tetany; no Trousseau's symptom; and no increased excitability of the nerves to electrical or mechanical tests; and frequently headache, vomiting, and a small and often slow pulse. Some forms of *acute rheumatism* have been confounded with tetany, but attention to the points which I have repeatedly named as characteristic of tetany will always settle the question. In some forms of *ergotism* spasms have been observed which resemble those of tetany; but ergotism is habitually endemic; it is generally connected with symptoms of spinal degeneration, such as loss of knee-jerk, lightning pains, impaired coördination, and not unfrequently with epileptiform convulsions. Localized convulsions, such as histri-

onic spasm, torticollis, and convulsions in some individual muscles of the extremities, have also been occasionally described as tetany, but only from ignorance. Lastly, *tetanus* affects more especially the muscles of the jaw, tongue, pharynx, larynx, the neck, body, and the abdomen; reflex excitability is increased throughout the system; when the extremities are affected, it is chiefly the extensors; and the fingers and hands, which suffer more particularly in tetany, are spared in tetanus.

This seems to be the most fitting opportunity to speak of tetanilla, or Friedreich's paramyoclonus multiplex, as another form of muscular spasm which is not very uncommon in practice. I have seen the complaint especially in neurotic subjects, frequently with a history of masturbation and inherited nervous affections; and between the ages of fourteen and fifty-four. All the patients were males, and no particular exciting cause could be discovered. It differs from tetany chiefly by the convulsions being clonic, and by the absence of prolonged muscular rigidity, and of Trousseau's symptom. The convulsions are, moreover, generally symmetrical; they cease during sleep, and do not impair motive power or coördination. The nutrition and electrical reactions of the muscles are normal, but their reflex excitability is increased, the knee-jerk more especially being greatly exaggerated.

The degree of spasm varies considerably, being in some cases slight, and in others of considerable severity; in some temporary and in others almost incessant. All the muscles of the body may be affected, either simultaneously or successively. The spasm very commonly affects the adductor of the thumb and the interosseous of the first finger, so that a movement as that of holding the pen for writing is produced, and the bellies of these two muscles are distinctly seen to contract under the skin. Each contraction lasts five or six seconds, is entirely painless, and is presently succeeded by a variable number of other contractions, of which, however, there are rarely more than six or seven. After this there is an interval of rest, and then a further similar set of contractions. Other muscles which suffer frequently are the deltoid, the rectus femoris, the flexor muscles of the legs, the orbicularis of the lips and eyes. Of the latter muscles, generally only small portions are affected; for instance, the parts immediately adjoining the commissure of the lips, which are spasmodically contracted for a few seconds, then relax and repeat this performance five or six times consecutively, after which the muscle is quiet for a few minutes, and then begins to play again.

In other cases the spasm is much more violent, and spreads over a much larger number of muscles. There may be a more or less constant clonic convulsion in the muscles of the face, neck, chest, and abdomen, as well as of the limbs, and which is occasionally intensified by more powerful contractions of individual muscles, by which the head may be suddenly pulled to the side or backward, the eyelids closed, a sudden inspiration like singultus may be caused, and arms and legs thrown about. Perfect rest generally eases the spasms, while walking, using the hands, etc., is apt to increase them; and the patient may, therefore, be more or less disabled from following his occupation.

In one of my cases, that of a cabinetmaker, aged twenty-six, the right upper extremity was the exclusive seat of these clonic convulsions, which were quite sufficiently strong to throw the limb about in all directions, generally lasted two or three minutes at a time, were succeeded by four or five minutes' rest, and then began again. This man was utterly unable to earn his living through this most annoying affection. But it is chiefly the influence which the recurrence of such symptoms has on the mind of the sufferer that is of importance. One of my patients, who suffered in this way, had been told that it was a sign of beginning progressive muscular atrophy; and as he had suffered from syphilis, and was in a low state of health, this prediction made him quite hypochondriacal. Another patient, a medical man, who had read about Jacksonian epilepsy without having seen a case of it, believed that these clonic spasms were the first symptom of tumor of the brain, and that he was on the high road to become blind, epileptic, and imbecile. A third patient, likewise a medical man, had given up a large practice on this account, and gone abroad, being convinced that he was suffering from brain disease.

It is, therefore, important to know the differences which exist between the muscular twitches seen in progressive muscular atrophy, the spasms observed in Jacksonian epilepsy, and the clonic spasms of tetanilla or paramyoclonus multiplex.

The twitches or fibrillary motions of muscular fibres which are seen in patients suffering from progressive muscular atrophy, are generally of a sluggish and worm-like description. There is nothing sudden or actually spasmodic about them, and as they affect more or less individual fibres only, they are not in general sufficiently powerful to cause movements of the limbs or any parts of them. They come and go, are easily excited by passing the finger-nail over the affected limb, or by exposure to cold, and are essentially diffuse in character. They must be considered as a sign that degeneration has been set up in the muscular fibres, and have in general a bad prognostic significance showing that the disease is progressing. I need not further dilate upon the complete difference which exists between them, Jacksonian epilepsy, and tetanilla. The spasms of the latter are certainly not forerunners of any serious cerebral or spinal disease, for in one case which I have seen, they first occurred at sixteen years of age and subsequently at various times; at fifty-four years, however, the patient was still in good health, although occasionally subject to attacks of this kind, which sometimes lasted for a few weeks, and then ceased. All my other cases have recovered. These spasms, I believe, to be owing to a similar, although much slighter degree of irritation in the giant cells of the anterior gray matter of the cord than those of tetany.

The *prognosis* of tetany is generally not serious, except in very young children who have no power of resistance, and where spasm of the glottis or general convulsions are often so easily induced. It is also not favorable in persons who are extremely cachectic, and reduced in strength. In most cases,

however, tetany is not a dangerous complaint, and the patients recover in two or three months, more especially if placed in favorable circumstances.

For the *treatment* of tetany, Trousseau recommended bleeding and cupping of the spine; yet he mentions a case in which, by bleeding, the affection was made much worse and more general. At first the patient only suffered in his hands, so that the fingers were clenched and useless; but after the bleeding, the other parts of the limbs as well as the muscles of the body became affected, so that he sat quite motionless, and could hardly speak or breathe. In the present day bleeding is not likely to be resorted to, more especially as the patients are habitually in a state of exhaustion, through persistent diarrhœa, or when convalescent from acute disease. Just on the contrary it should be our endeavor to build up the constitution of the patient, by removing him, if possible, from his habitual injurious surroundings, by giving him nutritious and easily digested food, and such remedies as cod-liver oil, phosphorus, and arsenic. In recent cases in which exposure to cold and wet appears to have been the cause, the Turkish bath or a wet-pack, ammonia and opium should be used. Where diarrhœa is present, astringents, more especially opium and aromatic sulphuric acid, are to be given. Where worms are suspected, the usual anthelminthic remedies find their appropriate sphere of action.

As direct sedatives, hydrate of chloral and urethan act better than hypodermatic injections of morphia. Those highly popular remedies, iodide and bromide of potassium, have also been called to our aid, and have proved useful in some cases. Electricity has frequently been employed without success, when applied to the affected nerves and muscles; while the application of a large anode to the spine with the cathode at a distance, seems to be much more useful as having a sedative effect on the unduly excitable gray cells. For cutting short an individual attack of tetany, which threatens life through involving the larynx and diaphragm, I know nothing equal to a subcutaneous injection of pilocarpine, which seems to act like magic. As soon as profuse perspiration is established, the spasm ceases, and the patient is rendered comfortable.

The treatment of tetanilla should be chiefly mental. The patient must be assured that there is nothing serious the matter with him, and that his brain is unaffected. Electricity, used in the way just described, and Paquelin's cautery are other appropriate remedies, and rarely fail to cure an affection which, while it is apparently insignificant, yet suffices to make life utterly wretched for these patients, and has driven some of them close to committing suicide. Indeed, there is nothing really insignificant in the practice of our profession, as slight causes may lead to grave results, often through the agency of the imagination.

COCAINE IN OBSTETRICS.

BY BARTON C. HIRST, M.D.,
ONE OF THE VISITING PHYSICIANS TO THE MATERNITY HOSPITAL.

IN the wards of the Maternity Hospital I have had an opportunity of using cocaine in a sufficiently large number of cases to convince myself of its efficiency in alleviating, if not entirely annulling, the pain of the second stage of labor, especially in its latter part, when the child's head begins to distend the lower portion of the vagina and the perineum. To still the cramp-like pain of the first stage of labor, I believe chloroform will still be found to be best.

From the notes of a number of cases, I select the two following:

CASE I.—A. B., primipara, æt. twenty-two; labor began at 3 A.M. July 27, 1886. As the cervix was being dilated, and the head began to descend, the woman showed signs of great suffering, threw herself about the bed, became livid in the face; at 5 P.M. the first application was made; almost immediately the patient became quiet, and remained so till the birth of the child, of which she said she was hardly conscious; in all, there were four applications made from 5 P.M. to 8 P.M., the hour of the birth.

CASE II.—Mrs. D., æt. twenty-four, primipara; labor began at 6 P.M. August 9, 1886. Os fully dilated at 1 A.M. August 10th. Child delivered at 5.55 A.M. As the head began to descend, and from then till the birth of the child, cocaine was applied every half-hour; for that length of time the woman, who was quite intelligent, said that the local anæsthesia was almost complete; at the end of that time, however, the effect of the drug seemed to wear off. The preparation used was an ointment of the strength of four per cent., applied with the finger, as evenly as possible, to the mucous lining of the vagina and to the skin of the perineum.

TWO CASES OF HEMORRHOIDS CURED BY INJECTIONS OF CARBOLIC ACID.

BY GEORGE E. READING, M.D.,
OF WOODBURY, N. J.

MY first experience with this treatment was a little more than one year ago, when a patient, Mr. H. V. R., presented himself to me with the statement that he had long been a sufferer from internal piles, and that while spending some time in Denver, Colorado, the previous winter, he had been operated upon by a surgeon, who injected something into the piles which made them grow smaller. Being summoned home suddenly, he came to me to have the treatment finished.

Upon looking up the method of treatment in Gross's *Surgery*, I found that it is passed by with the slight mention that it consists in injecting six or eight drops of the pure liquefied acid. I accordingly did this with the effect of causing great swelling with subsequent sloughing of the tumor and the formation of an ulcer, which, however, healed kindly in about a week.

The patient said that he experienced much more pain from the injection, which I practised, than from those used by his physician in Denver during his treatment there.

This was the state of my knowledge of this treatment until I saw, in the *American Journal of the Medical Sciences* for July, 1885, an article entitled "The Treatment of Hemorrhoids by Injection," by Charles B. Kelsey, M.D., of New York.

From that I found that my mistake had been in using too strong an injection, and that, for soft internal piles, such as my first case, solutions of the acid of from fifteen to thirty per cent. were quite sufficient, and would cause much less pain and swelling.

My next case was one which gave this treatment as severe a test as it will often be subjected to.

Mrs. M. E. H., aged 35, widow, consulted me on May 12, 1886, with this history. She had suffered from piles as long as she could remember, having frequent attacks of inflammation, during which she suffered intense pain while walking or at defecation.

Upon examination I found a tumor the size of a shelled walnut protruding from the anus. The patient stated that it had not been returnable for several years. The tumor had evidently undergone fibrous change, and was very hard and firm.

I made an injection of six minims of the pure liquefied carbolic acid, choosing this because of the great firmness of the tumor. At the end of four days I made another similar injection, and upon making my third visit, one week after the first, I found that the tumor had markedly decreased in size and had become much softer.

I now began the use of a fifty per cent. solution, and made two injections per week for three weeks (making eight injections in all), when the tumor had entirely disappeared; and this had occurred without confining the patient to bed for more than an hour or two after each injection, and throughout she had been enabled to attend to her household duties, including the care of two children. The patient voluntarily stated that she had actually suffered less during the four weeks which the treatment lasted, than she had the preceding four.

For the details of this method of treatment I refer the reader to Dr. Kelsey's article.

MEDICAL PROGRESS.

Chorea cured by Gymnastic Exercises during Hypnotism.—Dr. Riccardo Pari (*Lo Sperimentale*, July, 1886) gives a very careful and detailed account of a case of chorea in an Italian girl æt twelve. When it came under his notice it was not otherwise remarkable except that it had lasted for four years. It came on after a sharp attack of scarlet fever, and there was no accompanying rheumatism or hysteria of any sort. Careful hygiene had been kept up, and treatment by electricity, tonics and arsenic, fully tried. When examined in October, 1885, there was no anæmia, no cardiac abnormality, or other morbid physical signs beyond moderately severe bilateral chorea. In recent medicine there are some cases of chorea cured by suggestion in hypnotism, and this was first tried by Dr. Pari. The girl was hypnotized by making her gaze fixedly at something in her hand, and it was strongly urged upon her when she was in the hypnotic condition that she should have no more chorea. Two such attempts had no success, which was ascribed partly to her distrust in all methods of cure after her long experience. Then it was remembered how useful gymnastics had been in the cases of Hasse, and at the third hypnotic sitting this idea was taken up, and she was ordered to hold out her arm and keep it still. There was slight tremor after six or seven minutes (when the muscles in a normal state generally begin to grow exhausted), but she was ordered to keep it still, and succeeded in doing so for much longer. In subsequent sittings, she obeyed orders to keep both arms outstretched for a quarter of an hour without tremor, to walk quietly, to stand still in all varieties of positions, first on one leg, then on the other, etc. Between the sittings there was gradual improvement, and after twenty of them she was quite well.—*The Practitioner*, October, 1886.

Use of Cold Inhalations in Fever.—Woitkewitsch records the treatment of fifteen fever patients by inhalations of cold air. Eleven of the patients suffered with typhoid fever, one with pleuritis, and one with pneumonia. The observations were seventy-one in number. The air respired was cooled by a special apparatus to temperature from 25° to 31° F. The duration of each application of the treatment was from fifteen minutes to three-quarters of an hour. The author's conclusions are as follows:

1. The patients' temperature was diminished but little by this treatment, and only for a short time.
2. The frequency of the pulse and respiration is notably diminished.
3. The general condition and sleep are temporarily improved.
4. The symptoms of bronchial catarrh were diminished to a remarkable degree.
5. No harmful results of this treatment were noted in any case.—*Centralblatt f. d. gesammte Therapie*, Aug. 1886.

The Decomposition of Ergotine Solutions.—As the result of elaborate bacteriological studies, Engelmann, of Kreuznach, presents the following conclusions:

1. Pure ergotine, unmixed, and dispensed in sterilized glass, may be preserved almost indefinitely.
2. Aqueous solutions of ergotine undergo a more or less speedy decomposition. This is due to the action of microörganisms.
3. Such solutions, when introduced subcutaneously, induce varying degrees of inflammation.
4. The addition of antiseptic agents to such solutions, as ordinarily practised, only delays the decomposition.
5. In order completely to prevent the development of living ferments, the antiseptic must be added in quantities which are directly irritating, and which, in frequent use, are not indifferent in their action upon the organism of the patient.
6. Ergotine solutions may be quite far advanced in decomposition before the eye can detect such change.
7. Ergotine may be most advantageously administered subcutaneously, when dissolved in water previously sterilized by a half hour's boiling.
8. The solution may be best effected in the syringe itself.
9. The distilled water of the apothecaries usually contains bacteria, often to such an extent that from a single drop there may be cultivated upon the gelatine plate many thousands of colonies.
10. In all solutions of drugs to be used subcutaneously,

it is therefore advisable that the water should be sterilized by prolonged boiling just previous to its use.

11. The decomposition of pure ergotine has been found to be due to bacterial impurities on the glass vessels used. A large number of microörganisms cause decomposition in the solutions; the ordinary bacteria of decomposition, however, are the most active.—*Deutsche medicinische Wochenschrift*, Sept. 30, 1886.

THE DIETETICS OF PULMONARY PHTHISIS. — DR. ALFRED L. LOOMIS writes as follows in the *Journal of Reconstructives* for October, 1886:

Some of the most important rules which govern the dietetics of phthisis may be formulated as follows:

1. Every phthisical patient should take food not less than six times in the twenty-four hours. The three full meals may be at intervals of six hours, with light lunches between.

2. No more food should be taken at any one time than can be digested easily and fully in the time allowed.

3. Food should never be taken when the patient is suffering from bodily fatigue, mental worry, or nervous excitement. For this reason, midday naps should be taken before, not after, eating. Twenty to thirty minutes' rest in the recumbent posture, even if sleep is not obtained, will often prove of more value as an adjuvant to digestion than pharmaceutical preparations.

4. So far as possible, each meal should consist of such articles as require about the same time for digestion, or, better still, of a single article.

5. Within reasonable limits the articles of any one meal should be such as are digested in either the stomach or intestine alone—*i.e.*, the fats, starches, and sugars should not be mixed with the albuminoids, and the meals should alternate in this respect.

6. In the earlier stages the amount of fluid taken with the meals should be small, and later the use of some solid food is to be continued as long as possible.

7. When the pressure of food in the stomach excites cough, or when paroxysms of coughing have induced vomiting, the ingestion of food must be delayed until the cough ceases, or an appropriate sedative may be employed. In those extreme cases where every attempt at eating excites nausea, vomiting, and spasmodic cough, excellent results are attained by artificial feeding through the soft rubber stomach tube.

8. So long as the strength will permit, assimilation and excretion must be stimulated by systematic exercise, and when this is no longer possible, the nutritive process may be aided by passive exercise at regular intervals.

The following may serve as a sample menu for a day in the earlier stage. The meat soup is made by digesting finely chopped beef (1 lb.) in water (Oj) and hydrochloric acid (5 ♏) and straining through cheese cloth.

Menu.

On waking.—One-half pint equal parts hot milk and vichy, taken at intervals through half an hour.

8 A.M.—Oatmeal with abundance of cream, little sugar; rare steak or loin chops with fat, cream potatoes; soft-boiled eggs, cream toast; small cup of coffee, two glasses of milk.

9 A.M.—Half ounce cod-liver oil, or one ounce peptonized cod-liver oil and milk.

10 A.M.—Half pint raw meat soup; thin slice stale bread.

11–12.—Sleep.

12.30 P.M.—Some white fish; very little rice; broiled or stewed chicken; cauliflower; stale bread and plenty of butter; baked apples and cream; milk, Kumyss or Matzoon, two glasses.

2 P.M.—Half ounce cod-liver oil, or one ounce peptonized cod-liver oil and milk.

4 P.M.—Bottle Kumyss or Matzoon; raw scraped beef sandwich.

5.30–6 P.M.—Rest or sleep.

6 P.M.—Some thick meat or fish soup; rare roast beef or mutton; spinach; slice stale bread; custard pudding; ice cream.

8 P.M.—Half ounce cod-liver oil, or one ounce peptonized cod-liver oil and milk.

9–10 P.M.—Pint iced-milk; cup meat soup.

1–2 A.M.—Glass milk, if awake.

ACORN COCOA IN THE TREATMENT OF DIARRHŒA AND VOMITING IN CHILDREN.—Acorn cocoa is a preparation of ordinary cocoa powdered and freed from fat, to which are added the soluble parts of roasted acorns without cellulose, and a little sugar and roasted flour. Liebreich suggested this combination, and that it should be tried in the treatment of diarrhœa and vomiting of children, and it was found that of one hundred and two cases of diarrhœa with vomiting only six died, and the remainder recovered in from one to eight days. This combination is now manufactured as a substitute for tea coffee, or cocoa, and is refreshing, tasty, and nutritive even for adults. DR. F. W. ELSNER (*Australasian Med. Gazette*, June, 1886) has also had a considerable experience with this remedy in this class of cases, and has obtained marked success by its use. His mode of administration was to mix a teaspoonful of it with cold water in a small cup, and then to boil it, constantly stirring, and this quantity is administered thrice daily by means of a spoon or feeding-cup. All other food and medicine is prohibited, and the quantity may be gradually reduced. Dr. Elsner has notes of twenty cases of continuous and exhausting diarrhœa with persistent vomiting, which had continued for three weeks in two cases, and for shorter periods in the others. In half the cases various remedies had been employed before the acorn cocoa was administered; in the others, however, it was the first drug given, and its effect was rapid and complete in each instance, and it never took more than two days to bring about improvement, while twelve days was the outside limit of time in which a complete cure was effected.

SOLANINE.—GENEUIL has made an elaborate study of the physiological effects and therapeutic applications of solanine, and arrives at the following conclusions:

1. Solanine is a poison to the terminal plates of motor nerves. Its action is narcotic upon the medulla, cord, and trunks of both sensory and motor nerves.

2. Solanine may be prescribed without danger in relatively large doses. Its action is not cumulative.

3. It causes no cerebral congestion, even in the aged.

4. Its use is indicated in all diseases in which there is to be combated excitement, pain, or spasm. It has been employed with success in various forms of rheumatism, asthma, sciatica, and various neuralgias. The aggregate daily dose is from one to seven grains, by the mouth or hypodermatically.—*Bulletin Général de Thérapeutique*, September 30, 1886.

THE MEDICAL NEWS.

A WEEKLY JOURNAL

OF MEDICAL SCIENCE.

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SATURDAY, OCTOBER 30, 1886.

THE BILOXI FEVER.

THE difficulty which exists in forming a judgment as to the precise nature of a fever which seems to have been prevailing in Biloxi, Mississippi, for the last two months; and the controversy which has occurred about it, illustrate phases of human nature with which sanitary officials of practical experience soon become familiar. Biloxi is a small town on the Gulf Coast, on the Mobile and New Orleans Railroad, lying nearly opposite to Ship Island. About the end of August last several cases of fever occurred there, with two or three deaths, and it was rumored that these were cases of yellow fever. An investigation was made by members of the Louisiana Board of Health, resulting in a decision that it was sufficiently probable that the disease was yellow fever to warrant the establishment of non-intercourse with the town. The local physicians, however, maintained that it was not yellow fever, and in this opinion Dr. Godfrey, of the Marine-Hospital Service, concurred, after a visit to the place. This opinion of Dr. Godfrey was accepted as final, the quarantine was raised, and the inhabitants of Biloxi were highly indignant at what they claimed was the entirely unnecessary injury which had been inflicted on the business interests of the town. For about a month nothing more was heard of the matter; but, within the last ten days, startling rumors began to appear in the press, to the effect that the fever had spread so as to affect nearly all the inhabitants of the town, that there were many deaths, that the dead were being buried at night for purposes of concealment, etc. It was also reported that the local physicians were divided in opinion as to the nature of the disease. Upon this the Louisiana Board of Health again declared quarantine against Biloxi.

Subsequent reports indicate that there has been much exaggeration in the recent rumors about the Biloxi fever, and, with our present knowledge, its precise nature must be considered as uncertain. Now, why is this? What is the reason that in the presence of over fifty cases of fever which has produced fifteen or twenty deaths, physicians should find themselves unable to agree as to whether the disease is specific yellow fever or not? and why is it that there is such general distrust of the opinions of local physicians, when these take the ground that the disease is not yellow fever? It would seem that one great reason for this uncertainty is the lack of complete and reliable clinical records, and of post-mortem examinations. If the physicians of Biloxi have kept proper temperature records, and records of the condition of the urine as regards albumen, there should be little room for difference of opinion after comparing such records of thirty or forty cases, and their publication would be the most satisfactory means of settling the question. That the decision as to the nature of a suspicious outbreak of fever at any point on the Gulf Coast must turn very largely on such records is well known to physicians in that locality, and hence the neglect to publish them when disquieting rumors arose, is in itself a suspicious circumstance.

It must be remembered that the inhabitants of a town thus affected, and the health authorities of neighboring towns and States look at the matter from almost totally opposite points of view. The first say, "You have no business to interfere with our commerce until you can prove that this is yellow fever." The second say, "It is our duty to act as if this is yellow fever, until you prove that it is not." Really the interests of both parties are one and the same, and demand the fullest publicity of details in such cases as this. The publication of mere opinions, that Dr. A. thinks it is malarial fever, and Dr. B. is sure that it is not yellow fever, have little effect in quieting apprehension, not nearly so much as the publication of the temperature records of three or four cases would do.

Fortunately it is now so late in the season that there is little reason to fear serious spread of the Biloxi fever, even if it be true yellow fever. Whether it be merely malarial fever or true yellow fever, the people and physicians of Biloxi would have done well to furnish full and accurate information to the public as to the nature and progress of the disease from the very commencement of the appearance of disquieting rumors.

TUBAL PREGNANCY.

IT must be admitted that our knowledge of the determining causes and of the diagnostic signs of tubal pregnancy is still far from complete; we are

prepared, therefore, to welcome any additional information that may be gained from a study of these cases. A valuable addition to the literature of this subject is made by DR. WYDER, of Berlin, in the *Archiv für Gynäkologie*, Heft iii. Band xxviii. It is based upon a most exhaustive study of five cases, each presenting many interesting features, which have been minutely observed and carefully recorded. Indeed, the report might serve as a model to those members of the profession who, having an opportunity of seeing such cases, should wish to publish the results of their observation. Thorough reports, of single cases, although not conclusive in themselves, would, when taken in conjunction with many others, soon give us a mass of material from which we could formulate definite laws in regard to the etiology, diagnosis, and treatment of a condition as yet not fully understood, although its results are usually so disastrous, and the necessity for active interference on the part of the physician is often so urgent.

The fact that the profession is not yet in a position to diagnosticate extrauterine pregnancy with certainty, is well illustrated by five cases reported by Dr. Wyder Three were falsely diagnosticated, one, it is true, by a student; but his mistake was natural: there was a history of cessation of the menses for two months, an enlarged uterus, considerable hemorrhage, and a mass, which subsequently proved to be the decidua, was projecting from the external os. While waiting for the further progress of what was thought to be a case of abortion, the woman suddenly exhibited all the symptoms of internal hemorrhage and shock, and in a few minutes was dead. The post-mortem examination showed that there had been a tubal pregnancy, with rupture of the sac and escape of a large quantity of blood into the peritoneal cavity. A more careful examination during life would have revealed, of course, a tumor in the immediate neighborhood of the uterus, but to have differentiated this from a small cyst of the ovary, or from a simple collection of fluid in the tube, would have been difficult. Had the diagnosis been made, however, and had it been followed immediately by an operation for the removal of the tube, the woman's life would probably have been saved. As soon as the sac had ruptured, with the ensuing symptoms of internal hemorrhage and collapse, the diagnosis should have been made with some degree of certainty, and immediate laparotomy would have been the only measure offering much hope of relief. Of the two other cases in which the tubal pregnancy was overlooked, one was declared by staff-surgeon Bungeroth, of the Charité, to be an ovarian cyst, while the other in the clinic of Professor Winckel, then of Dresden, was diagnosticated, simply, as retrouterine hæmatocele.

Of these five cases, three recovered, one owing to an operation performed for what was supposed to be an ovarian cyst. The tumor removed from this last case, and the preparations from the two fatal cases, revealed some very interesting pathological conditions. In one case there had been undoubtedly an "outer migration" of the ovule from the right ovary through the abdominal cavity to the left tube; while in one of the others there had been an "inner migration" of the ovule from the left ovary through the left tube, across the cavity of the uterus, and into the right tube, where it had become impregnated. Only two well-authenticated cases of this kind have been reported,—one by Schultze, in the *Würzburger medicinische Zeitschrift*, 1863, Band iii., the other by Hassfurther, in his inaugural dissertation at the University of Jena.

Dr. Wyder's theory that the uterus is the "meeting place" of ovule and spermatozoa is opposed to the opinion held by the majority of the present school of German gynecologists, but he certainly presents strong arguments for his view of the case. The appearance of the cilia on the uterine mucous membrane at puberty, and their action from without inward, would seem to indicate that they are intended to assist the progress of the spermatozoa, while they prevent the too rapid descent of the ovule toward the cervix. On the other hand, the cilia of the tubes, which are present from birth, act in the opposite direction—that is, from the ovary toward the uterus—and this, in conjunction with the sinuosity of the passage and the peristaltic movements of the tubes toward the uterus, would seriously retard the progress of the spermatozoa, in spite of their inherent power of motion. Moreover, coitus usually taking place after, and not during menstruation, the spermatozoa will find the ovule already in the uterus, for it can be pretty clearly shown that the passage through the tubes by the ovules is accomplished within four or five days, while ovulation, as is generally admitted, occurs at the beginning of menstruation.

The well-known fact that coitus at any time may be followed by pregnancy, can be explained in two ways: either that the ovum, having reached the uterus, retains its vitality during a whole intermenstrual period; or that the spermatozoa retain their power of impregnating the ovule for some time after being deposited in the uterus. In this connection, Hausmann (*Ueber das Verhalten der Samenfäden in den Geschlechtsorganen des Weibes*) reports a case in which the spermatozoa were found in full activity eight days after the last coition. This subject is an interesting one, and presents a fine field for further investigation, which may, perhaps, prove that Dr. Wyder's theory is more nearly correct than the belief, at present prevalent, that the ovule becomes impregnated before reaching the uterus.

THE CREMATION OF TOWN REFUSE.

THE satisfactory removal of town refuse would appear to be a problem most difficult of solution, if we may judge from the experience of American cities. And yet there is no valid reason why success in this important branch of civic sanitation should not be achieved, if proper skill and the necessary resources were devoted to the accomplishment of this object. Feasible plans embracing schemes for the inoffensive utilization or destruction by fire of these waste matters have been proposed, and, in some instances, have been adopted on a small scale, with a show of success, but no large city has hitherto ventured upon the experiment.

Under the present methods no satisfactory means exist by which dry refuse can be immediately and safely disposed of, and consequently our suburbs are burdened with deposits of decaying and fermenting matters which pollute the air with their foul odors, and otherwise give rise to grave complaints. Very recently public attention has been directed to this subject by the disgusting nuisance created in the outskirts of a prominent city by the improper disposal of kitchen refuse, and fresh interest has been imparted to the question of disposal by fire.

If sufficient revenue can be derived from the products of cremation to reduce the cost of this method within reasonable limits, the chances of its adoption will be greatly improved. There can be no doubt as to its superior advantages from a sanitary standpoint. The effort now being made on a large scale at Pittsburg, Pa., to test the practicability and advantages of cremating the entire refuse of a town, will be watched with intense interest, as the results of the experiment, if successful, will go a great way toward inaugurating a reform in methods which have hitherto been the opprobrium of the sanitary management of every city in the land.

POISONING BY OYSTERS.

A VERY interesting account of several cases of poisoning in which the results were directly traceable to the ingestion of stale oysters, is given by DR. BARDET, in the October number of *Les Nouveaux Remèdes*.

On the first of last September, a vender of oysters passed through a small town in Brittany, and emptied his basket in selling to eight families. The first two families, who received oysters taken from the top of the basket, and presumably fresher than the others, suffered no harm. In each of the remaining six families, from one to four members were taken violently ill, in from fifteen to twenty-two hours, with colic, intense vomiting, and purging. The matters vomited contained bile but no food, showing that gastric digestion of two meals had been completed before the attack. Despite active treatment intense depression and atrocious colic persisted for several days. It seems clearly shown that the trouble was not due to putridity of the oysters themselves, for they were observed to be alive and apparently in good condition, though not of entirely agreeable taste.

The theory that these cases of poisoning were due to some alkaloid of decomposition, would seem to be negatived by the length of the interval between ingestion and illness. This point is one which clearly separates these cases from those of poisoning by mussels. The history, indeed, leads one to suspect the presence of some acute infection of bacterial origin, the incubation period of which would correspond with the interval referred to. Unfortunately, none of the toxic material was retained for study, and a clear field remains open for a most interesting series of experiments and observations upon the etiology of poisoning by oysters.

A REMARKABLE CIRCULAR.

A NUMBER of physicians in this city have recently received a circular signed by an "M.D.," as the director of a "maternity home" in New York, which seems to call for some public comment. This institution, of the existence of which we were not before aware, is one in which women, who are about to become mothers of illegitimate children, may get rid of all the inconveniences and responsibilities of motherhood for something more than $100; that is to say for an "entrance fee" of $75, and board at the rate of $10 a week. For the additional sum of $25 the "staff," who are said to be members of the County Medical Society and connected with the colleges and other public medical institutions of the city of New York, undertake to "remove" a child immediately after its birth, so that the mother "need not see it again." In addition to this tempting offer to those who are threatened with becoming the parents of illegitimate children, this circular contains the statement that "uterine cases" will be received at the rate of $25 a week, and that "a special fee will only be required for *capital operations*." To facilitate the complete and quiet accomplishment of the objects of this interesting institution, the circular states: "We are ready at all hours to send one of our physicians or nurses to any railroad depot or steamboat landing, or to *any* place in *any* State, to meet a person coming to our house; also to take charge of a child for adoption, upon receipt of the necessary expenses." These inducements are specifically offered to "unmarried females of respectable family," who are assured that their cases will be managed with perfect secrecy.

The thought which naturally arises after reading

this singular circular is simply this: If it does not propose the most cowardly crimes of this generation, namely, abortion and infanticide, it is very unfortunately worded; while, if this is what it is meant to do, we hope there is law enough, and decency enough, in New York city to break up such an abominable concern. We would also suggest to the New York County Medical Society that its friends would be pleased to hear that it is impossible that any of its members should actually be connected with the so-called "staff" of this institution.

SOCIETY PROCEEDINGS.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Conversational Meeting, October 13, 1886.

DR. CHARLES H. BURNETT read a paper on

CHRONIC PURULENT OTORRHŒA: ITS NATURE AND TREATMENT.

(See page 477.)

DR. SAMUEL SEXTON, of New York, was introduced to the Society. He regretted that the instructive paper of Dr. Burnett could not allow us to go back a little and discuss some of the acute processes which precede chronic disease of the ear. He might perhaps be allowed to make one remark with reference to that matter. In all the cases of inflammation of the ear where we can look into the tympanic cavity and see the seat of the disease, we are generally looking upon a comparatively simple case, which heals rapidly if not too much interfered with by treatment. Where the atrium is thus affected alone, the inflammation usually heals rapidly, but this is not the case in those cases in which the attic of the tympanum is principally affected, where the seat of disease is almost entirely out of the range of view on looking into the ear. It is under such circumstances that we so often have a serious case to deal with, both in acute and chronic inflammations. In those cases where the attic is considerably inflamed, it will be found on looking into the external auditory canal, that the membrana flaccida is red and bulging, and that there is tumefaction of the superior and posterior wall adjacent, sometimes with effusion sufficient entirely to close the canal. It is in these acute cases that, if we make a free incision into the walls of the canal, and into the attic, we shall establish free drainage, and avoid a chronic case. This at least has been his experience. Where there is a run-down condition of the system the result may, of course, be somewhat different.

Dr. Burnett had gone over the subject so thoroughly that he should confine his remarks more particularly to the treatment of inflammation of the attic. The attic and the upper cellules constitute a portion of the upper air tract, and are very liable to inflammation. In the treatment of chronic purulent inflammation, which we have under consideration, the trouble lies with drainage, as it does in the management of a great majority of surgical affections. The compartment above the atrium, and behind the membrana flaccida, which is almost as large as the atrium itself, is cut off by the swelling of the lining membrane of the attic, and drainage cannot take place except through the Eustachian tube; and it is in these cases that we have the periodical gathering and breaking which is so common in protracted cases of middle ear disease. Every time the patient takes a head "cold," the membrane lining the parts is liable to become inflamed, and the space between the ossicles and the inner wall of the tympanum becomes closed, and secretions from above cannot escape. In studying these cases of incurable inflammation of the upper ear tract, he thought that benefit might be derived from an operation, and, six or eight months ago, he began performing this operation, which may be described as follows: In the first place he might say that we should not attempt this operation where the membrana tympanum remains to a sufficient extent to respond to aërial vibrations of sound in any effective manner. In these old cases, however, it will usually be found that the major portion of the membrana vibrans has been destroyed, so that there is no danger of injuring the hearing power of the patient. In these cases the membrana flaccida is usually considerably thickened, and the handle of the malleus is retracted against the inner wall of the drum-head, or, perhaps, partially, or entirely lost from caries. In the majority of cases, the stapes is detached from the long process of the incus. In these cases no harm can be done by excision of the ossicles, and much benefit may be derived by the operation. The first procedure then, consists in detaching the portion of membrana flaccida which remains, from that portion of the tympanic ring formed by the margin of the auditory plate. This is done with a knife that is so placed on the handle that it may be passed around close to the auditory plate with ease. Passing the knife further back, the chorda tympani may be detached on each side. Where the tensor tympani muscle remains, it may be readily divided. Although this step of the operation is simple, it is liable to be accompanied with considerable bleeding. Where there are many granulations in the tympanum, it is well sometimes to postpone the operation until they have been removed to a certain extent by treatment. In order to remove the malleus, he had an instrument made which answers very well. This is passed from behind over the ossicles, and they are drawn downward. When they come into view, they are seized with forceps and easily detached. Having removed these portions, it is well to scrape the attic thoroughly, and remove all carious bone. It will be found that mucous membrane remains on the inner side of the attic. This should be removed with a scraper of another kind, which is a modified form of that often used by dermatologists. Care is to be taken not to injure the oval or round windows while scraping. In these cases, the stapes is rarely found present, except so far as its base is concerned. At first he employed insufflations of salicylic acid after the operation, but he now makes no applications, simply keeping the parts clean. In one or two weeks the parts begin to clean up, and usually before three weeks have elapsed the part is completely covered with a sort of dermoid dry membrane. Where any diseased bone or polypoid tissue remains, as sometimes occurs in the antrum, it must, of course, be removed.

The hemorrhage is at times troublesome, but it is never of a serious nature, and is easily arrested by cotton tampons or by the use of very hot water. In regard to injury of the chorda tympani nerve, it may be said that

there is nearly always more or less disturbance of the function of taste, but in the course of a few weeks this disappears. In one or two cases there has apparently been a descending neuritis which has manifested itself by slight pain in the mastoid cellules extending into the face.

With regard to the treatment of attic cases where the membrana vibrans remains, we frequently meet with cases where the membrana flaccida alone is perforated and perhaps with a polypus presenting at this opening. These cases usually occur between the ages of twenty and forty. They seem to be a continuation of a chronic process in the attic where nature has done a great deal toward healing the parts. Where a polypus presents, the speaker has usually used the biting forceps and removed it, and followed this by the introduction of pure salicylic acid. He sometimes uses it dissolved in ether and applied on a cotton-wool carrier. This will often destroy the base of the polypus. In this way these cases may often be kept in abeyance, and sometimes entirely cured.

In reference to the dry treatment, he thinks that perhaps this has been carried too far. Where boracic acid is allowed to remain in the ear for a length of time it may become a source of irritation. He does not use this remedy as frequently as he formerly did.

These chronic cases, in his experience, are rarely attended with pain, and for that reason are more apt to be neglected. It is only when there is an exacerbation of the inflammation that attention is called to them. Sometimes a polypus becomes inflamed and may cause serious symptoms from pressure. He has seen facial paralysis caused in this way, as well as certain vertiginous symptoms which are quite alarming. Generally, on the removal of the polypus these symptoms disappear.

The question is often asked as to the advisability of leaving cotton in the canal in cases of chronic purulent inflammation of the middle ear. As a rule, he thinks that it is better omitted. So long as there is any hope of healing a perforation it is quite a different matter.

The use of cocaine has not been of as much service in otology as in other departments of medicine. He has tried it for the relief of pain in many operations without success. He has, however, used it with advantage after the removal of a polypus, or after the excision of the ossicles.

In closing his remarks, Dr. Sexton called attention to an instrument which he applied for operation in acute cases of periostitis of the canal and attic. The instruments usually employed are too small and not sufficiently strong to make the required incision. With this knife the incision can be readily made in the walls of the canal and through the membrana flaccida into the attic, thus establishing drainage in these acute cases. It is here that he thinks that the surgery of the future in otology lies. If we can make early incisions and give vent to the pus, we shall have few serious cases. He cannot recall the occurrence of a single case of mastoid disease, so called, where this treatment has been promptly adopted. We have been able to treat these cases much more satisfactorily since the introduction of the electric light. It is a difficult matter always to obtain proper illumination with the ordinary light.

DR. HARRISON ALLEN suggested that attention be given to that phase of the affection which pertain to a desquamative catarrh which simulates the purulent discharge from an old bone-fistule. When the low degree of vascularity of the temporal bone and all its belongings is considered, it becomes a matter of no surprise to find that the necrotic variety of chronic otorrhœa is probably more frequent than is generally supposed, for it is evident that a discharge may be necrotic without the presence of a tangible sequestrum. Should not the treatment of the discharge, he asked, be based upon the methods employed by the general surgeon in the case of ordinary bone-fistule? Practitioners, he thought, should be less timid in proposing incision of the mastoid region. Dr Sexton has shown the safety of ablation of the ossicles under circumstances which prove that broadly conceived plans of surgical interference are tenable in treating these and analogous conditions directly within the external meatus and its associated approaches to deeper structures.

The term "tubercular catarrh" is a misnomer, unless tubercle can be detected in the middle ear. He might be corrected by Dr. Burnett, but he ventured to say that no deposits of tubercle have yet been demonstrated in the mucous lining of the tympanic chamber. The presence of a purulent discharge from the middle ear of a tubercular subject, is a sign of impending dissolution.

DR. GEORGE C. HARLAN said that the plan of treatment which he had adopted in these cases was substantially that recommended by Dr. Burnett. He derived a little more assistance from the patients and their friends than Dr. Burnett is inclined to do. It is often inconvenient to see a chronic case of this kind every day. In the intervals between the patient's visits, he sometimes allows him or his friend to inject with a small syringe, a solution of borax, or boracic acid, or of chloride of zinc. This latter he frequently uses in the proportion of two to five grains to the ounce.

The treatment of those cases to which Dr. Sexton had alluded, has been extremely unsatisfactory. The operation proposed by Dr. Sexton seems to have a sound basis, and to offer some hope of a good result in this class of cases.

With reference to the so-called dry treatment, his experience has been much like that of Dr. Sexton. We should have a definite idea as to the class of cases in which this plan of treatment is to be adopted. He thinks that it is of doubtful utility where there is a considerable portion of membrane left. In such cases the powder cannot reach the seat of disease, and may occlude the opening, preventing the escape of discharge. Nor is it applicable where the discharge is thick or at all profuse.

Some years ago he reported two cases in which death was due to long-standing, uncomplicated, purulent aural catarrh. In one case the pus reached the brain through destruction of the roof of the tympanum, and there was an abscess of the cerebrum. In the other case, it passed through the internal auditory meatus, and produced an abscess of the cerebellum.

DR. SAMUEL D. RISLEY had had no experience with the method of operation proposed by Dr. Sexton, but when a suitable opportunity presents itself, feels disposed to try it. These chronic discharges are not always due to pent-up discharges in the attic, but may be due to damming up of the secretions by the presence of granulation masses blocking up the narrow space between the

tympanic wall and the remaining rim of the tympanic membrane, which it is frequently found necessary to remove by the dry treatment, alcohol, or other applications, so that the pent-up secretions can escape into the external meatus.

The dry treatment still serves him a good purpose. It does not work well in all cases, but he considers it a great advance on former methods of treatment. He still feels disposed to use a pledget of well-selected cotton in the canal. It should not be thrust to the bottom of the meatus except when intended to act as a wick for the removal of the discharge. Properly used it prevents the entrance of dust, foreign bodies, and floating germs.

He wished to allude to the important relation which exists between these chronic discharges and the constitutional troubles from which the patient is suffering. He has a number of cases in which he can find none of the local conditions referred to. There is probably no special attic disease, but these patients suffer from lithæmia. In one instance there is pronounced gout. This patient will get entirely well, and then will have a recurrence of the swollen, tender joints. This will be followed by a discharge from the ears, preceded by the well-known pharyngeal conditions long recognized as associated with lithæmia. This will get better after an immense deposit of uric acid in the urine, or possibly an attack of indigestion. We have of late years come to recognize this relation in the etiology of pharyngeal disease. He is convinced that the disease of the middle ear in these cases of lithæmia, is intimately connected with the general dyscrasia.

DR. RALPH W. SEISS said that it might be of interest, in reference to the prognosis of purulent otorrhœa to notice some experiments which Dr. Chrystie and himself had made on dogs. The operation consisted in making an incision behind the auricle, then an incision in the membrana tympani, and scratching the membrane of the middle ear, and rubbing into the scratch a small drop of chloroform. This set up a purulent otitis, which was allowed to continue from one to four or five weeks, when the dogs were killed. Some five or six dogs were operated upon. Of this number he thought four had ascending neuritis—having lost his notes, he could not speak positively.

Clinically, there seems but little to add. Sufficient stress has not been laid on the importance of treating the nose in these cases. Many cases occurring in children with a marked nasal catarrh, may be treated indefinitely with remedies directed to the otorrhœa, and receive no benefit. If, however, the affection of the nasopharynx is removed, the otorrhœa will often disappear without special treatment.

DR. CHARLES S. TURNBULL agreed with the author in nearly all that he had said. His experience had been the same with the dry treatment (boracic acid powder, etc). He agreed with him in his objections to the use of the syringe by the patient or his friends. There is danger even in permitting them to use instillations. He was pleased to learn that there is a chance for some surgery in otology, especially if it be of benefit in these cases. At the same time, he thought there was much guesswork about it. It looks all very well in a diagram, but he was sure that it cannot be performed with ease, or without risk. He considered the procedure heroic.

He has been successful in treating several cases of chronic inflammation of the "attic," by applying a saturated solution of nitrate of silver or carbolic acid to the attic on a cotton carrier, the extremity of which had been bent at a right angle.

With reference to pledgets of cotton or wool in the ear, he thinks that they do more harm than good. The small amount of dust, or other foreign material, kept out, does not overbalance the danger from corking up a pus-secreting cavity.

Those tuberculous cases in which the membrane "melts down," he has felt at a loss to explain, pathologically; but, nevertheless, as Dr. H. Allen has said, he feels that it seals the fate of the patient. In a paper before the State Medical Society, two years ago, he stated that he considered tubercular otitis to be incurable. He recently saw in a medical journal a short article referring to a unique case of exclusion of tuberculous ulceration of the mouth, gums, and lips, under the observation of Dr. J. Solis Cohen. He thought that this might possibly help to explain the manner in which the membrana tympani "melted down" so rapidly in these cases of tuberculous disease—*i. e.*, by similar extension through the Eustachian tube.

DR. LOUIS J. LAUTENBACH said that in the treatment of these cases of ear disease he had employed two drugs which are comparatively new, one of which—the peroxide of hydrogen—was referred to to-night. This may be employed in connection with either wet or dry cleansing and can be used alone or with the dry treatment. It seems to be particularly valuable in cases where the discharge is loaded with pus and when the discharge is thick and ropy. In these cases its use, after water cleansing, is to decompose the adhering discharges, giving a clean surface upon which to apply a remedial agent. In cases of thin, watery, or mucous discharge, the peroxide occasionally cures. This remedy is to be used alone only when the ordinary treatment fails, its chief value being evident when used as a cleanser, preparing the parts for treatment.

In acute exacerbations of chronic purulent disease, as well as in acute cases, he had found osmic acid of great value for the relief of the excessive pain which so frequently is present. He had used this since the 30th of April. At that time he was treating a case of threatening mastoid disease. The man had been suffering with excessive ear pain for more than six weeks, blisters and leeching giving but temporary relief. The pain was excessive; no sleep night or day. Everything seemed without avail; aconite, atropia, cannabis indica, chloral, morphia were used in immense doses without result. Osmic acid having been referred to in a medical journal as having relieved the severe pains of sciatica, was used as a forlorn hope. At 2 P.M. he was given, hypodermatically, directly above the auricle, one-fifth of a grain, and at 4 P.M. the pain was gone. When he saw him in the morning he was astonished to find him without pain, and yet more surprised at the promptness of the drug's action. Since then he has used it upon five cases in doses of one-tenth to one-twentieth of a grain, and has found it to give relief. He had not found it necessary to give more than two injections to any patient.

In some cases of chronic suppuration he has found a small suction apparatus of value. He uses it only

when other treatment seems to fail to arrest the discharge. Apparently it is of no value except as a more perfect method of cleansing, exhausting the ear cavity of any moisture that may remain after the ordinary cleansing.

DR. SAMUEL SEXTON desired to say one word in reference to the criticism concerning the difficulty of this operation for the removal of the ossicles. Of course, it is not a very simple and easy operation, but it is entirely practicable, and anyone who is familiar with the anatomy of the parts may perform it safely. Very often the handle of the malleus, or long process of the incus, will be found lying on the inner wall of the tympanum, making it difficult to get the instrument behind them. But often by a little manipulation an experienced operator may succeed. He has performed it in over a score of cases, and in not one has there been reason to think that any harm was done. The cases have to be selected. If there is much vascularity, some of the work, of course, has to be done slowly, or the case may require two operations. The operation often requires from one-half to three-quarters of an hour for its performance.

There is one point to which he did not refer, namely, after excision of the ossicles the drum-head is not reproduced. In cases where the drum-head has been destroyed by sulphuric acid or other agents, there has, in some cases, been a complete return of the structure in the course of a few weeks.

In reference to a point mentioned by Dr. Allen, he would say that he had recently a case resulting fatally in which tubercles were found in the temporal and occipital bones. The middle ear was not examined.

DR. BURNETT did not wish his position with reference to operations on the mastoid to be misunderstood. If the cortex is diseased he thinks that it is perfectly proper to remove such diseased bone, but unless it can be shown that to operate upon a healthy cortex will prevent the advance of caries upon the inner wall, he would say that he does not know when trepanation of the mastoid should be performed. It remains to be shown that an advance of necrosis on the inner wall and into the lateral sinus can be prevented by such an operation. If pachymeningitis has ensued an operation on the mastoid is useless.

In regard to tympanic disease occurring in tubercular cases, he would simply refer to a paragraph which, for the sake of brevity, he intentionally omitted in reading the paper.

In using the dry treatment he had not met with any of the objections to which Dr. Harlan had referred. He has yet to see a case of mechanical blocking of the canal by the dry treatment. We must combine the dry treatment with some moist treatment. He never said anywhere that it should be relied upon wholly. There are cases where the syringe must be used, but it should be done by the surgeon. If the treatment is given into the hands of the patient, it will be much protracted.

With reference to the instrumental removal of granulations, he would say that he has never seen good results from this practice. If a granulation is snared off, it will return in a few hours. The granulations must be cauterized with chromic acid or dried up by the dry treatment, or by means of alcohol, which, by its affinity for water, squeezes the life out of the granulation. Cotton may be worn in dry ears but not in running ears.

The constitutional treatment of these cases goes without saying. He has not seen the cases referred to by Dr. Risley in which it was possible to connect so closely the gouty tendency with the aural trouble, as Dr. Risley appears to have been able to do.

He would be unwilling to rely on applications made with a bent probe in the treatment of attic disease. It would be difficult thoroughly to apply the treatment through a small perforation by such means.

He has employed the peroxide of hydrogen for several years. It simply breaks up the pus and is a great cleanser, and is of great service to the aurist on account of the tortuous passages which he must cleanse in order to treat the tympanum. Aspiration is he thinks unnecessary after the use of the peroxide, and if applied under such circumstances it practically amounts to cupping the ear.

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, October 21, 1886.

THE PRESIDENT, A. JACOBI, M.D., IN THE CHAIR.

GIFTS TO THE ACADEMY.

DR. GEORGE A. PETERS, Secretary of the Board of Trustees, announced that $5000, a portion of the sum of $20,000, the bequest of the late Dr. Beadle, which the Academy would ultimately receive, had now been paid.

He also announced that Mrs. Anna Woerishoffer, the widow of the late Mr. Charles F. Woerishoffer, had donated to the Academy the sum of $25,000; this being one-fourth of a memorial fund, in honor of her husband, which she proposed to devote to certain scientific and charitable objects. Dr. Peters read the letter which Mrs. Woerishoffer had sent accompanying the check for $25,000, and also the letter of acknowledgment which had been sent in reply.

DR. FORDYCE BARKER offered a series of resolutions, thanking Mrs. Woerishoffer for her munificent gift, and making Mr. and Mrs. Woerishoffer Permanent Benefactors of the Academy, which was unanimously adopted. In offering these resolutions, Dr. Barker remarked that before very long he hoped to see the Academy in possession of a fund of not less than one million dollars, a fund which it needs to place it in the position which the scientific demands of the times require of it.

DR. FRANCIS DELAFIELD read a paper on

PULMONARY EMPHYSEMA.

He commenced by giving a *résumé* of the varieties, causes, symptoms, physical signs, favorable prognosis, and treatment of emphysema usually given in the text-books; in which it is stated that those suffering from this affection are but little liable to become the victims of phthisis and pneumonia. He then remarked that the student when he got into practice for himself was often surprised to find that the characteristics of the affection, as it actually occurred, according to his observation, did not correspond at all with those set down for it by the great mass of authorities. He would find that it did not necessarily arise in connection with bronchitis, and that playing on wind instruments was not a common cause of emphysema. He would find

that the immunity from phthisis and pneumonia was open to question, and that barrel-shaped chests are not so frequently met with as he had been led to suppose. Moreover, if he made autopsies, he would find that the dilatation of the air-spaces or air-vesicles was by no means always proportionate to the severity of the symptoms that had been present during life.

It is true that chronic bronchitis and attacks of asthma are frequent enough; yet there are other cases in which such conditions are entirely absent, and substantive emphysema is essentially different from what the classical descriptions of it would lead us to suppose. It is, therefore, important to decide what we really do know, and what we do not know, about the disease. It is well, on the whole, to divide the varieties of emphysema, according to the recognized classification, into the interlobular or interstitial and the vesicular forms, and to divide the latter into senile, lobular, and substantive.

Senile emphysema is due simply to a senile change in the parenchyma of the lung, and when it is present there is no obstruction to the passage of blood through the lungs, and no dilatation or hypertrophy of the right side of the heart. Chronic bronchitis is often present, but the affection is not severe, and of no very grave import. In some instances substantive emphysema commences in the earlier portion of life, and as the patient grows older, senile emphysema occurs also. It is not always easy to distinguish between the two, and yet the distinction is very important; for, while substantive emphysema is a very serious affection, the senile variety, as had been mentioned, is not.

Dr. Delafield then went on to say that substantive emphysema is in reality a form of pneumonia. It is, in fact, an inflammation of the same type as that which so often attacks the endocardium, the inner coat of the arteries, the kidneys, and the liver. The walls of the ventricles are first attacked, and while some of them become thickened, others become thin. The dilatation, both of the vesicles and the air-spaces, varies in different cases, and is by no means proportionate in many instances to the severity of the symptoms present. In fact, many of the cases are overlooked at autopsies, because there is no dilatation of the air-spaces visible to the naked eye.

Later on, the emphysema spreads, and attacks other parts of the lungs, including the epithelial cells lining the air-spaces and the mucous membrane of the bronchi. The pleura also becomes thickened, numerous pleuritic adhesions form, and the whole condition is, in short, that of interstitial pneumonia. In the milder cases there is but little disturbance of the circulation of the blood; but in the severe cases this gives rise to the worst symptoms. The right ventricle of the heart becomes hypertrophied and dilated, and venous congestion and dropsy follow. The secondary symptoms are, indeed, the same as those of valvular cardiac disease.

Having referred to the various complications liable to arise, he stated that this affection is one that is very frequently met with in New York; coming on, as a rule, in individuals from forty to forty-five years of age. Hereditary influences are marked. The same causes are active in producing it as in the case of chronic endocarditis, chronic arteritis, chronic nephritis, etc. It is of more importance to recognize the cases of moderate severity than the very bad ones, because in the latter comparatively little can be done in the way of treatment. In the moderate cases there is no change in the shape of the thorax; though in old and aggravated cases the barrel-shaped chest is not infrequently present. The pulmonary resonance may remain unaltered for a considerable time.

Having spoken in detail of the physical signs present, Dr. Delafield said that the emphysema may continue for years without giving rise to any rational symptoms. The condition, however, can be generally recognized by taking into consideration the age and general condition and tendencies of the patient. There are other cases in which the presence of Bright's disease or cardiac trouble causes the emphysema to be lost sight of. The dyspnœa at its worst is constant and extremely distressing. In the bad cases there are also more cough and venous congestion, followed by general dropsy.

The disease may pursue a number of different courses. In the first place, a patient who has suffered a long time from winter cough and is always a little short of breath on making exertion, will at length develop spasmodic asthma. There will follow increasing dyspnœa, loss of flesh and strength, venous congestion, dropsy, and death. Another class of patients will be apparently entirely well, except when they have an attack of acute bronchitis. After a time, however, venous congestion, albuminuria, and dropsy will ensue, as in the preceding variety. Still another class will suffer for years from spasmodic asthma before the evidences of emphysema show themselves. Finally, there is a class of cases in which the symptoms are very slight for a long time; when venous congestion and the other grave symptoms will suddenly become developed. The behavior of the affection is, therefore, on the whole, very like that of the atrophic form of chronic Bright's disease.

In speaking of the treatment, he said that the same general rules, as regards hygienic surroundings, climate, mode of life, etc., which had a favorable effect on the progress of other affections of the same class, such as chronic Bright's disease, etc., are applicable in emphysema. It is a question of some importance whether the dyspnœa and asthmatic attacks which so frequently characterize it, are not due in reality to a contraction of the arteries and capillaries, since it is found by experience that many of the drugs which are the most serviceable in relieving these conditions, are those the physiological effect of which is to produce a relaxation of the walls of these vessels.

The conclusions arrived at by Dr. Delafield were somewhat as follows: Emphysema is not a local chronic disease due to excess of inspired air over expired air, or to fatty degeneration, but a chronic inflammation of the lungs; nor is the dilatation of the air-cells and air-spaces an essential part of the affection. The result of this inflammation is such an irregular thickening and thinning of the walls of the air-spaces as would naturally occasion the dilatation of some of them. The dyspnœa and general venous congestion are not due simply to the dilatation, but to the contraction of the pulmonary blood-vessels. Excessive bodily exertion is not the cause of emphysema. In the treatment the indications are to delay the progress of the chronic inflammation and to

overcome the contraction of the bloodvessels present. Chronic bronchitis is, of course, to receive proper attention.

[At the conclusion of the paper, Dr. Delafield exhibited, by the aid of a magic-lantern, a number of sections of lungs taken from different patients, illustrating the points referred to.]

Dr. E. Darwin Hudson, Jr., said that the author of the paper had given his ideas of emphysema from a pathological point of view. Personally he was more accustomed to regard it from its clinical aspect, particularly in connection with the physical signs to which it gives rise; although he had had the opportunity of studying the disease to a considerable extent in the deadhouse also. This post-mortem experience, however, was, of course, limited when compared with that of Dr. Delafield. He has always looked upon the account of emphysema of the lungs given by Waters, of Liverpool, as affording a very definite and accurate idea of the affection. In the paper of the evening Dr. Delafield had described other diseases, more particularly interstitial pneumonia, with emphysema. He (Dr. Hudson) was still of the opinion, however, that we had to take emphysema as a distinct type, and that it consists essentially in rarefaction of the pulmonary structure, as described in Reynolds's *Practice*, and other standard works. The clinical history of the disease has to be taken into consideration, as well as the pathological conditions found after death. It is very common for women at the climacteric period to become obese and develop emphysema, with the barrel-shaped chest so often described as characteristic of the affection. Here the condition could hardly be due to alteration in the anatomical structure of the lung; though no doubt this was the case in other instances. The results obtained from Voldenberg's apparatus, and more recently from Ketcham's pneumatic cabinet, throw considerable light on the nature of emphysema; which was shown to be a disease in a large number of cases in which there is a loss of elasticity and resiliency on the part of the air tubes and vesicles.

No disease is more perplexing to the practitioner than emphysema. It is too apt to be the case, as Dr. Delafield had remarked, that the student expects to find a uniform character in all the cases; while in reality there is great difference in different cases. For instance, in some the pitch of the resonance is high, while in others it is low.

It is, no doubt, true that in a certain number of the cases of emphysema the gouty diathesis is present, with interstitial disease of the kidneys, or other characteristic lesions; but there are a large number of other cases in which the affection is purely mechanical.

Dr. Charles Heitzman said it was some fifty years since Rokitansky gave to the world an accurate knowledge of emphysema, and that ever since then its pathological and clinical characteristics had been well known. It seemed to him that Dr. Delafield either had not seen a pure case of the affection, or had not demonstrated one. The sections which he had exhibited this evening were certainly not specimens from simple emphysema. As Dr. Hudson had stated, they were emphysema combined with interstitial pneumonia. It was, indeed, not a primary disease, but a secondary one. He had in his possession an ample number of specimens taken from cases of pure emphysema, and they were altogether different from those which Dr. Delafield had shown. His own father, who was now eighty-two years of age, was a good example of typical emphysema. As to the pathology of the affection, as interpreted by Dr. Delafield, viz., that it is due to contraction of the bloodvessels, he did not see why we should go to something which we could not prove for an explanation of the trouble. For himself, he was content to believe in the old view of the affection. As he had said before, the specimens shown were not examples of pure emphysema.

Dr. Delafield said that he was sorry that it had been supposed that he looked at the subject solely from a pathological point of view. He had intended the paper to have a clinical as well as a pathological bearing; and the ideas which he had tried to set forth in it were those which he had formed from a somewhat extended study of the disease, both during life and after death. It was hardly possible to dissociate the two sets of facts, and he did not know that he had anything more to add to what he had already said in the paper. The treatment which was found most effectual in emphysema was certainly fully compatible with the views which he had advanced.

Dr. Van Santvoord said that he had at present under observation two advanced cases of emphysema, which seemed to him to bear out the statement of the author of the paper that the affection is of great gravity in many cases; and since he had been in practice he had found out that many of the teachings in regard to emphysema, which he had heard when a student, are not born out by the facts. He then spoke of the great value, according to his experience, which caffeine had as a cardiac stimulant in these cases. The right heart is frequently embarrassed, and venous congestion is apt to occur long before it could be caused by tricuspid regurgitation, or at least before any tricuspid regurgitation could be recognized by the physical signs. He would like to ask Dr. Delafield his opinion in regard to the value of caffeine.

Dr. Delafield said that he thought caffeine a useful drug. It appears to stimulate the right side more than the left side of the heart, and the same is true of convallaria. Just as is the case in pneumonia, it is, therefore, indicated to stimulate the right heart in emphysema.

The President said that, according to the views which Dr. Delafield had expressed, the iodides which, as is well known, are in common use in this affection, are theoretically indicated in all those cases which occur in connection with chronic inflammation. The benefit which is afforded in chronic asthma, peri-bronchitis, etc., could only be explained on the ground that these agents act as absorbents. He would like to ask, therefore, whether, in every case of emphysema, iodide of potassium ought to do good, because it acts as an absorbent? Also whether all cases of emphysema are of the same character? There are some cases in which the affection comes on very suddenly, as, for instance, in connection with whooping-cough. To some extent the trouble is transient, and to some extent it becomes permanent, and the inflammatory element is not the prominent one.

Dr. Delafield explained that he referred only to chronic emphysema.

Dr. F. H. Castle said that of late calcium chloride,

which had been proposed a long time since in this connection, had been steadily growing in favor for the purpose of causing absorption of connective tissue products. He referred to the value in emphysema of remedies which relax the muscular coats of the bloodvessels, and said that he thought this had a direct bearing on the subject of the paper. For instance, the prompt relief afforded by nitrite of amyl would seem to indicate that the seat of the trouble is in the bloodvessels; for if the dyspnœa is due simply to dilatation, or to the presence of mucus in the air-vesicles, we can hardly account for the favorable action of this remedy.

DR. DELAFIELD said that he agreed with the President, that the iodide of potassium is one of the most valuable of our drugs in emphysema, and its action may well be supposed to be due to its effect on the bloodvessels, because it is a recognized fact that one of the effects of the iodides is to relax the smaller bloodvessels. Thus it is given in cardiac disease for its effect on the small arteries and capillaries. Another drug of the same class which is of great value is chloral hydrate, which acts in a similar manner. Large doses of chloral are extremely useful in acute attacks of dyspnœa, and small doses in chronic dyspnœa.

A PROPOSED BUILDING FUND.

DR. C. R. AGNEW gave notice of a proposed amendment to the By-laws establishing a building fund for the Academy.

NEWS ITEMS.

MONTREAL.

(From our Special Correspondent.)

MEDICO-CHIRURGICAL SOCIETY.—At the annual meeting held October 8th, the following officers were elected:

President.—Dr. James C. Cameron.

Vice-Presidents.—Dr. George Wilkins, Dr. T. Johnson Alloway.

Secretary.—Dr. R. F. Rutlan.

Treasurer.—Dr. A. Lapthorn Smith.

Librarian—Dr. T. D. Reed.

COLLEGE OF PHYSICIANS AND SURGEONS OF QUEBEC.—At a recent meeting of the Council of the College it was decided to increase the scope of the preliminary examination for admission to the study of medicine. The following compulsory subjects have been added to the already very extended list: elementary chemistry, mental and moral philosophy, and rhetoric. It is felt by the English-speaking members of the profession that the preliminary examination is already stringent enough, as evidenced by the great number of rejections, sometimes as high as sixty per cent. However, their French colleagues think that it is a step in advance and that it will reduce the number of entrances into the profession and so lessen competition. Philosophy being a subject taught in all the French schools and not in the English ones, it is considered by the English minority that the French majority are acting in rather an arbitrary and unjust way, but it appears that the Church demands the change in order to counteract the materialistic doctrines which are being taught in a certain powerful and well-equipped medical school; in this way they hope to protect their flock from that "horrible belief which is now so prevalent in old France and, in fact, throughout Europe," and which the teachers in the aforementioned school acquire when they go abroad to England, Germany, and elsewhere to qualify themselves more thoroughly for the positions they occupy.

After next year every person before being allowed to practise will be obliged to pass an examination in all branches of medical study before an examining board of the College of Physicians and Surgeons. No degree from a reputable British or Colonial university will, as heretofore, be accepted. This new regulation is to be enforced in order to weed out one or two weak colleges which have been granting degrees to irregulars and others throughout the province.

THE FEVER AT BILOXI.—A press dispatch from New Orleans states that the excitement which followed the establishing of quarantine against Biloxi has died out, and the fears that were entertained that yellow fever would be brought to New Orleans from the infected town have passed away. Biloxi is still shut off from the world, and the quarantine against her will be maintained at all places until a heavy frost does away with all danger. The situation in the town is unknown. The telegraph lines have been working uninterruptedly and every newspaper in New Orleans has a correspondent in the place, yet not a word regarding the fever has any paper been able to get for several days. No doubt is entertained that the correspondents, who are residents of the town, have been terrorized and compelled to stop giving out reports.

AN EPIDEMIC OF PLEURO-PNEUMONIA IN CHICAGO CATTLE.—Dr. Salmon, Chief of the Bureau of Animal Industry, in his official report upon the outbreak of pleuro-pneumonia at Chicago, says:

On September 22 I visited the Phœnix and Shufeldt distillery stables in company with the State Live Stock Commissioners and the State Veterinarian. Post-mortem examinations were made on the carcasses of four animals, and in every case lesions were revealed which are considered by the veterinary profession the world over to be typical and characteristic of contagious pleuro-pneumonia. On several subsequent occasions I visited these same stables and witnessed the examination of other carcasses which presented equally plain evidences of the same disease. . . . The milkmen at first stoutly denied the existence of any disease among their cattle, but when the evidence became too strong to be longer contested, it was admitted that they had recognized the appearance of a lung disease in 1884. They at first attributed it to chemicals used in the mash by the distillers, also to feeding the slop too hot, but had finally concluded it was contagious pleuro-pneumonia and had been practising inoculation to lessen the mortality. It was soon ascertained that cattle had been removed from the infected distillery stables, driven over the streets of Chicago and allowed to pasture on the commons. . . . The inspection of city and suburban herds brought out the fact that the contagion had been widely disseminated, that diseased cattle had been running upon lots where many cattle grazed, and that practically we must consider all of the unfenced pastures and vacant lots on the west and south sides of

Chicago as infected, and all the cattle running at large as exposed. Most of the cases of disease found were chronic, and some of the herds presented plain evidence of having been inoculated. The inoculation, which has been extensively resorted to in Chicago, while it has lessened the losses, appears to be one of the means by which the contagion has been so widely spread. . . . With contagious pleuro-pneumonia prevalent in the neighborhood of Chicago—the great live stock centre of the country, from which cattle are constantly moving in all directions—it may be truly said that the cattle industry of this country has reached a crisis. It may be still rescued from this scourge if Congress at the coming session can be made to realize the necessities of the situation.

AN EGYPTIAN MEDICAL JOURNAL.—*El thifaa* ("the cure") is the name of the only medical journal published in Egypt. It is printed in Arabic, and published monthly. Its price is thirty-five cents a number. The principal contributors are Egyptians and Syrians. It has proved in every way a success.

RESPIRATION AT HIGH ALTITUDES.—The August number of the *Alpine Journal* contains a statement of the results obtained by Dr. Marcet from many experiments on breathing while climbing at high altitudes. He first shows by experiments at ordinary altitudes and in a state of rest that some persons make much better use than others of the air they inhale, inasmuch as their exhalation is very rich in carbonic acid: this may be expressed by measuring the volume (at sea-level pressure and freezing temperature) of air inhaled to produce one grain weight of carbonic acid. Dr. Marcet himself had to breathe 15.5 litres of air, while two younger men needed only 13.7 and 10.8 litres respectively: the latter had a remarkable power of keeping his breath under water, and was little troubled in mountain ascents. Further experiments, conducted at various altitudes up to 13,600 feet, show, that, as a person ascends, he breathes fifteen to twenty-five per cent. less air (reduced, as above, to standard pressure and temperature) to produce a given weight of carbonic acid: the action of air on the blood in the lungs seems, therefore, to be facilitated with decreasing density. It is evident that this will materially diminish the quickness of breathing that would otherwise be required in rarefied air.

EUROPEAN PRECAUTIONS AGAINST RABIES.—An English Order in Council has been issued, under the Contagious Diseases (Animals) Act, dealing with the regulation and control of dogs. The order, which is cited as "The Rabies Order of 1886," provides for the extension of the Acts of 1878 to 1886, so that "dogs shall be animals and rabies shall be a disease" for the purposes of those Acts. The duty of the police on notice of rabies is defined, and special regulations are laid down for the guidance of local authorities as to the muzzling of dogs and the disposal of stray dogs, and as to the movement of dogs affected with or suspected of rabies. The order extends to England, Wales, and Scotland, and came into operation on October 1st. The following note on the steps taken in continental countries for the extermination of hydrophobia, has been sent by a correspondent to a contemporary, and will be read with interest. Writing from Geneva, he says: "The outcry against the order of Sir Charles Warren, with reference to the control of dogs in the British metropolis, is causing some little astonishment, in this as well as in other continental countries. The law relating to dog-muzzling which is periodically enforced over here is not unpopular, and statistics seem to show that in most cases it has considerably lessened the terrible disease of hydrophobia, and in some it has stamped it out altogether—notably in Norway. There, a few years ago, there was an outbreak of rabies; but as it was not considered serious, the law was not exercised, and the disease seemed to die out. The following year, however, there was a serious recrudescence, and an order was at once issued, that all dogs were to be securely muzzled, that no dogs would be allowed to be imported until they had been officially certified as being free from disease, and that any dog found without a muzzle would be instantly killed. This order was put into execution with an iron hand, and was kept in force for a whole year. The result is, I believe, that there has not been a case of hydrophobia or rabies in the country since. In Italy, a still more summary mode of procedure is in force. An edict goes forth that dogs are to be kept under control, which there means that they are not to be allowed out at all unless led by the owner. There is no ambiguity as to what 'proper control' signifies. In all towns and villages men go about with a cart covered with a net. The men are armed with long sticks, to which a formidable knife is attached. If a dog is met 'not under control,' he is instantly seized and pitched into the cart, the net holding him prisoner. If the wretched animal attempts to bolt he is pursued, the long sticks and knives are brought into play, and, in nine cases out of ten, the hacked and mutilated carcass of the poor animal is tossed into the cart, and as more frequently than not the creature is not killed outright, its suffering may be imagined. To all travellers and residents in Italy these ghastly loads are common and painful sights. When the cart is full it is taken to a specially appointed place, and the animals are despatched. This mode of stamping out hydrophobia is revolting, but it is certainly effectual, since the disease is very rare in Italy. In France and Germany periodical muzzling is also strictly enforced, and very little mercy is shown to animals found without the muzzle. In Switzerland, where there is a perfect craze for keeping dogs, every canton can issue an order at any moment, compelling owners to muzzle their dogs; and the instant rabies is suspected, the law is rigorously put in force—often on very insufficient grounds, and it is no uncommon thing for dogs to remain muzzled in some cantons for six months out of every twelve. During the time the order is in force, spies are specially employed to keep a lookout for unmuzzled curs, and every dog so found, no matter what his value may be, is seized, kept for a few hours, and if not then claimed, is despatched; while every gendarme and garde de la paix is empowered to kill a dog instantly, wherever it may be, if it shows the slightest signs of madness. Though the law might unquestionably be more humanely carried out, it must be confessed that hydrophobia has become very rare in this country."

MEDICAL WOMEN IN INDIA.—A meeting of the National Association for Supplying Medical Aid to the Women of India was held at Simla on Sept. 29, Lady

Dufferin presiding. The reports received from the various provinces were highly satisfactory. The main object now was to establish the association on a permanent footing, for which purpose further funds were required. The estimate for next year's work showed a surplus: but, before the financial condition of the undertaking could be called thoroughly satisfactory, it required a lakh and a quarter more capital. Sir C. Aitchison gave an account of the work done in the Punjab. He said that the province was not rich. The few wealthy men had given what they could, and the movement was spreading among other classes.

A DEFENCE OF TEA.—An article which appeared in our columns some weeks ago, says the *Lancet*, condemning the excessive use of tea as injurious, has come under the observation of the Chinese at Shanghi, and a recent copy of the *Shên Pao*, a local native paper, contains a leading article which is evidently founded upon a misconception of the tenor of our remarks. The writer states that for several hundred years no one has heard that the habit of tea drinking is an injurious one. Why should it suddenly become so to-day? Moreover, tea has been drunk in China for thousands of years without any apparent ill effects. Our contemporary then proceeds gravely to discuss the various sources from which this imagined danger may arise. The water cannot, it argues, be injurious, for it has been boiled, and as adulteration of the leaves has practically ceased, how can the pure article be injurious when the adulterated article which was exported and consumed for years had no evil effects? Another reason for the appearance of the article condemning tea has been suggested to the contributor to our contemporary, and although in his opinion it is not deserving of immediate and implicit belief, yet, looking at all sides of the question, he would not venture positively to state that it is devoid of truth. "It is said that a foreign doctor discovered a spring of water possessing valuable medicinal properties, and that after mixing some kind of preparation with it he put it up in bottles, like the lemonade and soda water used by foreigners here; that as the demand was not very brisk, he originated this story about the injurious properties of tea, with a view of increasing the sale of his preparation." Despite, however, such a low estimate of the honor of foreign medical men, the writer concludes with the expression of high admiration for their professional skill, which he contrasts with that possessed by the native faculty, much to the latter's disadvantage.

THE TEETH FROM A MEDICO-LEGAL ASPECT.—The identification of dead bodies and criminals is sometimes a matter of much perplexity. For instance: the features of a dead body may be distorted or destroyed; the clothes changed or unrecognizable; and no ordinary circumstances left to make identification clear. Some such a case occurred in Michigan. A man was found in a lake murdered. As the coroner was about dismissing the case as "unidentified," the neighboring dentist had the curiosity to look into the mouth. In a moment he said: "I have a chart of that mouth in my office," and though he could not then remember the name, he soon found it by referring to his chart book. It resulted in tracing the murderer.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM OCTOBER 19 TO OCTOBER 25, 1886.

WEBSTER, WARREN, *Major and Surgeon.*—Leave of absence on account of sickness further extended one year, on account of sickness.—*S. O. 244, A. G. O.*, October 20, 1886.

BILLINGS, J. S., *Major and Surgeon.*—Granted leave of absence for eight days.—*S. O. 246, A. G. O.*, October 22, 1886.

CORSON, JOS. K., *Captain and Assistant Surgeon.*—Granted leave of absence for one month, to take effect when his services can be spared.—*S. O. 246, A. G. O.*, October 22, 1886.

WEISEL, DANIEL, *Captain and Assistant Surgeon.*—Relieved from duty at Fort Fred Steele, Wyoming, and ordered to proceed to and take station at Fort McKinney, Wyoming, reporting to the commanding officer of that post for duty.—*S. O. 135, Department of the Platte*, October 15, 1886.

MOSELEY, E. B., *Captain and Assistant Surgeon.*—Relieved from duty in the Department of the Columbia, and ordered to report in person at headquarters, Division of the Pacific, for assignment to duty.—*S. O. 87, Division of the Pacific*, October 16, 1886.

TAYLOR, B. D., *Captain and Assistant Surgeon.*—From the Department of the East to Columbia Barracks, Ohio.—*S. O. 244, A. G. O.*, October 20, 1886.

TESSON, L. S., *Captain and Assistant Surgeon.*—From the Department of Texas to the Department of the East.—*S. O. 244, A. G. O.*, October 20, 1886.

BARROWS, C. C., *First Lieutenant and Assistant Surgeon.*—From the Department of Arizona to the Department of the East.—*S. O. 244, A. G. O.*, October 20, 1886.

EGAN, P. R., *First Lieutenant and Assistant Surgeon.*—From the Department of Arizona to the Department of Texas.—*S. O. 244, A. G. O.*, October 20, 1886.

WALKER, F. V., *First Lieutenant and Assistant Surgeon.*—From the Department of the East to the Department of Texas.—*S. O. 244, A. G. O.*, October 20, 1886.

CARTER, E. C., *First Lieutenant and Assistant Surgeon.*—Granted leave of absence for six months, with permission to apply for an extension, and to go beyond the sea, to take effect when his services can be spared.—*S. O. 244, A. G. O.*, October 20, 1886.

EDIE, GUY L., *First Lieutenant and Assistant Surgeon.*—Having returned from detached service in the Department of Arizona, will join his station at Fort McIntosh, Texas.—*S. O. 144, Department of Texas*, October 13, 1886.

CHAPIN, ALONZO R., *First Lieutenant and Assistant Surgeon.*—Relieved from duty at Fort Laramie, Wyoming, and ordered to Fort Washakie, Wyoming.—*S. O. 137, Department of the Platte*, October 19, 1886.

BLACK, CHAS. S., *First Lieutenant and Assistant Surgeon.*—Granted leave of absence for two months, on a surgeon's certificate of disability, to take effect when his services can be spared.—*S. O. 244, A. G. O.*, October 20, 1886.

IVES, FRANCIS J., *First Lieutenant and Assistant Surgeon.*—In obedience to instructions received from the Division Commander, ordered to report in person at headquarters, Department of the Platte, for duty.—*S. O. 146, Department of Texas*, October 16, 1886.

BANISTER, W. B., *First Lieutenant and Assistant Surgeon.*—Assigned to duty at Fort Wingate, New Mexico.—*S. O. 97, Department of Arizona*, September 29, 1886.

MASON, CHAS. T., *First Lieutenant and Assistant Surgeon.*—Relieved from temporary duty at Fort Verde, Arizona Territory, and ordered for duty at Fort Huachuca, Arizona Territory.—*S. O. 99, Department of Arizona*, October 12, 1886.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF MEDICAL OFFICERS OF THE U. S. MARINE-HOSPITAL SERVICE, FOR THE TWO WEEKS ENDING OCTOBER 23, 1886.

URQUHART, F. M., *Passed Assistant Surgeon.*—Relieved from duty at Cape Charles Quarantine, to proceed to Washington, D. C., with Steamer "Woodworth," October 20, 1886.

WASDIN, EUGENE, *Passed Assistant Surgeon.*—Promoted, and appointed Passed Assistant Surgeon from October 1, 1886, October 20, 1886.

WILLIAMS, L. L., *Assistant Surgeon.*—Granted leave of absence for three days, October 16, 1886.